

(FACE)

## PATENT APPLICATION



09037690

INITIALS \_\_\_\_\_

PART 239829

1989 U.S. PTO

09/037690



03/10/98

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ISSUE SLIP STAPLE AREA (for additional cross references)

| POSITION            | INITIALS | ID NO. | DATE    |
|---------------------|----------|--------|---------|
| FEE DETERMINATION   |          |        |         |
| O.I.P.E. CLASSIFIER |          | 21     | 3/23/96 |
| FORMALITY REVIEW    | DJS      | 65085  | 3 27 96 |

INDEX OF CLAIMS

✓ ..... Rejected      N ..... Non-elected  
 = ..... Allowed      I ..... Interference  
 - (Through numeral) Canceled      A ..... Appeal  
 ÷ ..... Restricted      O ..... Objected

| Claim | Final | Original | Date |
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If more than 150 claims or 10 actions  
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# SEARCHED

| Class   | Sub.                                    | Date     | Exmr. |
|---------|---|----------|-------|
| 424     | 442<br>283.1<br>130.1<br>157.1<br>158.1 | 6/2/98   | R     |
| 106     | 147.3<br>148.1<br>243                   |          |       |
| 426     | 89 92<br>140<br>657                     |          |       |
| 530     | 388.24<br>388.85<br>389.2               |          |       |
| UPDATED |   | 11/24/98 | ✓     |

# SEARCH NOTES (INCLUDING SEARCH STRATEGY)

|   | Date     | Exmr. |
|---|----------|-------|
| APS<br>DIALOG<br>BIO TECH<br>FEED/FOOD<br>PARTICLE?<br>ANTIBOD?<br>CHOLECYSTOKININ<br>LINOLEIC ACID<br>FAT  | 6/2/98   | R     |
| APS<br>DIALOG<br>BIO TECH/MEDICINE<br>INDEXES<br>FEED/FOOD<br>PARTICLE?<br>ANTIBOD?<br>ENDOGENOUS<br>GROWTH | 11/24/98 | ✓     |
| CHAROLYN PADEN<br>GP. 1700 EXR. 1761<br>FOOD ART  | 12/2/98  | ✓     |

# INTERFERENCE SEARCHED

| Class | Sub.                           | Date    | Exmr. |
|-------|--------------------------------|---------|-------|
| 424   | 442<br>130.1<br>157.1<br>158.1 | 12/3/98 | ✓     |
| 106   | 124.1                          |         |       |
| 426   | 89<br>140<br>657               |         |       |
| 530   | 388.2                          |         |       |

(RIGHT OUTSIDE)

PATENT APPLICATION SERIAL NO. \_\_\_\_\_

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE  
FEE RECORD SHEET

03/19/1998 HOLIVER 00000006 DAN:170053 09037690  
01 FC:101 790.00 CH  
02 FC:102 82.00 CH

|                                    |   |   |              |   |                                     |                    |                         |
|------------------------------------|---|---|--------------|---|-------------------------------------|--------------------|-------------------------|
| SERIAL NUMBER<br>09/037,690        |   | FILING DATE<br>03/10/98   | CLASS<br>424 | GROUP ART UNIT<br>1644  | ATTORNEY DOCKET NO.<br>960296.95297 |                    |                         |
| APPLICANT                          | MARK E. COOK, MADISON, WI; DARIA L. JEROME, FRAZEE, MN.<br><br><b>**CONTINUING DOMESTIC DATA*****</b><br>VERIFIED THIS APPLN IS A CIP OF 08/694,785 07/22/96 PAT 5,725,873<br><br><b>**371 (NAT'L STAGE) DATA*****</b><br>VERIFIED<br><br><b>**FOREIGN APPLICATIONS*****</b><br>VERIFIED<br><br>FOREIGN FILING LICENSE GRANTED 03/27/98   |   |              |   |                                     |                    |                         |
|                                    | Foreign Priority claimed <input type="checkbox"/> yes <input type="checkbox"/> no<br>35 USC 119 (a-d) conditions met <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after Allowance<br>Verified and Acknowledged <u>                    </u> <u>                    </u><br><small>Examiner's Initials                      Initials</small> |   |              | STATE OR COUNTRY<br>WI  | SHEETS DRAWING<br>0                 | TOTAL CLAIMS<br>10 | INDEPENDENT CLAIMS<br>4 |
|                                    | ADDRESS<br>BENNETT J. BERSON<br>QUARLES & BRADY<br>PO BOX 2113<br>MADISON WI 53701-2113   |   |              |   |                                     |                    |                         |
|                                    | TITLE<br>METHOD OF IMPROVING THE GROWTH OR THE EFFICIENCY OF FEED<br>CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN   |   |              |   |                                     |                    |                         |
| FILING FEE RECEIVED<br><br>\$1,002 |   | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>NO. _____ for the following: |              | <input type="checkbox"/> All Fees<br><input type="checkbox"/> 1.16 Fees (Filing)<br><input type="checkbox"/> 1.17 Fees (Processing Ext. of time)<br><input type="checkbox"/> 1.18 Fees (Issue)<br><input type="checkbox"/> Other _____<br><input type="checkbox"/> Credit |                                     |                    |                         |

09/037690

ABSTRACT OF THE DISCLOSURE

A method of improving the efficiency of an animal to convert feed into desirable body tissue involves feeding the animal feed particles having an inner core of nutrients and an outer layer containing a conjugated fatty acid or an antibody  
5 that can protect the animal from contacting diseases that can adversely affect the animal's ability to grow or efficiently convert its feed into body tissue.

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METHOD OF IMPROVING THE GROWTH OR THE  
EFFICIENCY OF FEED CONVERSION OF AN ANIMAL  
AND COMPOSITIONS FOR USE THEREIN

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is a continuation-in-part application of  
a application number 08/684,785, filed July 22, 1996, which will  
a ~~issue as~~ <sup>now</sup> US Patent No. 5,725,873 <sup>issued</sup> on March 10, 1998.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT  
Not applicable.

10 BACKGROUND OF THE INVENTION

The present invention relates generally to the feeding of  
animals. More particularly, it relates to a method of  
improving the animal's growth or the efficiency of the animal  
to convert its feed into desirable body tissue (e.g. muscle)  
15 and compositions for use in the method.

It is known that healthy, disease-free animals grow faster  
or are more able to convert their feed efficiently into body  
tissue than sick or immune-challenged animals. Obviously,  
faster growth or a more efficient conversion of feed into  
20 desirable body tissue in an animal is both economically and  
ecologically important, especially in animals raised for food.  
For this, and other reasons, it is desirable to prevent animals  
from contacting diseases.

One approach to keeping animals healthy is to give the  
25 animals antibiotics. However, that approach is not desirable  
for animals raised for food because there can be antibiotic  
residues in the food.

Another approach to keeping animals healthy is to immunize  
the animals. This can be done by vaccinating the animals  
30 against specific diseases to produce an active immunization or  
by administering to the animals antibodies to produce a passive  
immunization.

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In United States Patent Numbers 4,748,018 and 5,080,895, methods are disclosed for passively immunizing animals against intestinal diseases which could interfere with the animal's efficient conversion of feed. The patented methods basically  
5 comprise orally administering to said animals effective amounts of egg-derived materials containing avian antibodies which are obtained by immunizing egg-laying hens with specific antigens which will produce such antibodies, and obtaining the antibody containing material from eggs laid by the hen. In  
10 both patents, the antibody containing egg materials are reduced to powders and fed to the animals to be passively immunized.

#### BRIEF SUMMARY OF THE INVENTION

It is the primary object of the present invention to  
15 disclose a novel method to improve the animals growth or the efficiency of the animal to convert its feed into desirable body tissue.

Another object of the invention is to disclose an animal feed for animals for use in the inventive method.

20 The method of the present invention to improve the animals growth or the efficiency of the animal to convert its feed into desirable body tissue comprises orally administering to said animal feed particles having an inner core comprising primarily non-fat nutrients and, on an outer  
25 surface of the inner core, a safe and effective amount of an antibody that help protect the animal from disease or other antigens that can adversely affect the animal's growth or the efficiency of the animal to convert feed into desirable body tissue. The particles can alternatively be coated with  
30 another compound that improves the efficiency of the animal to convert feed into desirable body tissue.

The compositions of the present invention are animal feed particles having an inner core comprised of nutrients, and, on an outer surface of the inner core, a compound that  
35 improves the efficiency of the animal to convert feed into desirable body tissue.

The compositions of the present invention are conveniently made by first forming a nutrient mixture to

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produce an inner core, and then depositing the compound on the outer surface of the core. Surprisingly, an antibody on the outer surface retains immunological activity and is not destroyed by antibody destroying factors, such as

- 5 environmental conditions and intestinal proteases, even if the antibody is simply applied to the exterior of the pellet core without encapsulation in a protective fat layer.

- 10 In a preferred embodiment of the invention, antibodies are provided in solution or suspension in an aqueous or lipid carrier, although the antibodies can be applied directly to the pellet core without a carrier as, for example, a powder. The antibodies can be, but need not be, encapsulated in the lipid. The antibodies are obtained from the egg of a hen which has been injected with an antigen that results in the .
- 15 production by the hen of those antibodies.

- 20 Compositions of the present invention are superior to previously known animal feeds in which antibody-containing powders were mixed with nutrients, including fat, and then granulated or extruded, because the antibody-containing layer in the method of the present invention is applied to the core after the pelletization, extrusion, granulation or expansion process. As a result the antibodies in the outer layer of the compositions of the present invention are not degraded by elevated temperatures that can arise during pelletization,
- 25 granulation, extrusion or expansion processes. The compositions of the present invention are also superior to prior art feeds. If the antibodies are mixed into an outer layer of fat, the fat helps protect the antibodies from stomach acid and intestinal enzymes. If the antibodies are
- 30 not encapsulated in fat, they can be immediately released at high concentration into the gastrointestinal tract of the consuming animal and are not degraded upon ingestion.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS  
Not applicable.

- 35 DETAILED DESCRIPTION OF THE INVENTION

In the preferred embodiment of the present invention, the animal feed particles comprise an extruded inner core

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which contains primarily the desired non-fat materials, such as proteins and carbohydrates, and an outer layer of a compound that improves the efficiency of the animal to convert feed into desirable body tissue. The compound is preferably an antibody which can be optionally encapsulated in a lipid layer. Another compound that can be provided on the outer surface is a fatty acid that improves feed conversion efficiency. A preferred fatty acid is an 18-carbon conjugated diene. A most preferred fatty acid is conjugated linoleic acid (CLA). The outer layer also can contain other ingredients, such as oil-soluble vitamins and the inner core can, of course, also contain fat, if desired.

In the preferred practice of the method of invention, the animal feed is orally fed to the animal in an amount which will passively immunize the animal or otherwise enhance the efficiency of feed conversion by the animal.

The antibodies for use in the present invention are those which can alter physiological processes that adversely affect growth and feed efficiency. They can be antibodies that are against diseases or specific endogenous regulators of food intake and gastrointestinal motility. The antibodies are preferably derived from the eggs of hens which have been previously immunized to produce those antibodies as described in United States Patent Number 4,748,018 or 5,080,895. Especially preferred as the antibody-containing material are spray dried egg yolks and whole eggs. However, other non-egg derived antibody-containing materials may be used.

The free CLA isomers have been previously isolated from fried meats and described as anticarcinogens by Y. L. Ha et al., in Carcinogenesis 8(12):1881-1887 (1987). Since then, they have been found in some processed cheese products. Y.L. Ha, et al., J. Agric Food Chem. 37(1):75-81 (1987).

The free acid forms of the CLA may be prepared by isomerizing linoleic acid. The non-toxic salts of the free CLA may be made by reacting the free acids with a non-toxic base. Natural CLA may also be prepared from linoleic acid by the action of delta 12-cis, delta 11-transisomerase from a harmless microorganism such as the rumen bacterium *butyrivibrio fibrisolvens*. Harmless microorganisms in the

intestinal tracts of rats and other monogastric animals may also convert linoleic acid to CLA (Chin, S.F. et al., FASEB J. v. 6, abstract #2665 (1992)).

The CLA obtained by the practice of the described methods contains one or more of the 9,11-octadecadienoic acids and/or the 10,12-octadecadienoic acids and active isomers thereof. It may be free or bound chemically through ester linkages. The CLA is heat stable and can be used as is, or dried and powdered. The CLA is readily converted into a non-toxic salt, such as the sodium or potassium salt, by reacting chemically equivalent amounts of the free acid with an alkali hydroxide at a pH of about 8 to 9.

CLA can be a mixture of isomers of 9,11- and 10,12-octadecadienoic acid (c9,c11; c9,t11; t9,c11; t9,t11; c10,c12; t10,c12; c10,t12; and t10,t12) that would form from isomerization of c9,c12-octadecadienoic acid. As a result of the isomerization, only four isomers (c9,c11; c9,t11; t10,c12; and c10,c12) would be expected. However, of the four isomers, c9,t11- and t10,c12 isomers are predominantly produced during the autoxidation or alkali-isomerization of c9,c12-linoleic acid due to the co-planar characteristics of 5 carbon atoms around a conjugated double-bond and spatial conflict of the resonance radical. The remaining two c,c-isomers are minor contributors.

The relatively higher distribution of the t,t-isomers of 9,11- or 10,12-octadecadienoic acid apparently results from the further stabilization of c9,t11- or t10,c12-geometric isomers, which is thermodynamically preferred, during an extended processing time or long aging period. Additionally, the t,t isomer of 9,11- or 10,12-octadecadienoic acid that was predominantly formed during the isomerization of linoleic acid geometrical isomers (t9,t12-, c9,t12- and t9,c12-octadecadienoic acid) may influence the final ratio of the isomers or the final CLA content in the samples.

Linoleic acid geometrical isomers also influence the distribution of minor contributors (c,c-isomers of 9,11- and 10,12-, t9,c11- and c11,t12-octadecadienoic acids). The 11,13-isomer might be produced as a minor product from

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c9,c12-octadecadienoic acid or from its isomeric forms during processing.

5 The preferred inner core for the animal feed particles is an extrusion which contains a mixture of nutrients, such as grains, with or without added sugars, carbohydrates and/or proteins. The core will normally contain less than the desired total amount of the dietary fat for the animal because of the fat in the outer layer.

10 The fat for use in the outer layer can be any fat or lipid, which can be readily mixed with the antibody containing material to form a mixture, which contains the antibody therein and which can be readily sprayed or otherwise coated on the outer surface of the core. The antibody need not be directly on the surface of the inner  
15 core. Rather, one or more intermediate layers, comprising, for example, a binding agent, can be provided between the antibody and the core. Especially preferred are those fats which are solid at ambient temperatures and which will protect the antibodies from adverse environmental conditions  
20 and intestinal enzymes. Especially preferred as the fat is a mixture of tallow and CLA which increases feed efficiency.

Representative of other fats that can be used are the following:

25 Lard  
Yellow Grease  
Poultry Fat  
Spent Restaurant Oil  
Animal Oils  
Vegetable Oils  
30 Fish Oils  
Oil Derivatives, i.e. lecithin  
and  
Mixtures thereof.

The practice of the present invention is further  
35 illustrated by the following examples:

#### Example 1

##### Preparation Of Antibodies.

- An antigen, such as cholecystokinin peptide which produces cholecystokinin (CCK) antibodies, is injected
- 5 intramuscularly into mature hens at a dose of about 50  $\mu$ g to 1000  $\mu$ g with a water-in-oil emulsion adjuvant. Samples of the whole eggs or yolks of eggs from the hens are assayed by known methods for CCK antibody content. When the CCK
- 10 antibody titer reaches a maximum level, the whole eggs or yolks of eggs are collected and pooled, homogenized and spray dried to obtain a powder.

#### Example 2

##### Preparation Of Animal Feed Particles With Outer Layer Of Fat Containing Antibodies.

- 15 A CCK antibody-containing powder made by the process of Example 1 is mixed with tallow to form a blend in which the powder is substantially encapsulated by the fat. The fat mixture is then spray coated upon inner cores made by the pelletization, the granulation, the extrusion or the
- 20 expansion of a plasticized mixture of nutrients, including carbohydrate, protein and water. The resulting animal feed particles have an inner core of nutrients and an outer layer of fat containing CCK antibodies.

#### Example 3

##### 25 Animal Feeding Test.

- Ducks are fed the animal feed of Example 2 and their biological responses are determined. It is found that the ducks receiving the animal feed of Example 2 demonstrate an improved body weight gain and a more efficient rate of feed
- 30 conversion than control ducks.

Table 1 shows the results obtained in 14 day old ducks fed a control feed and an otherwise identical feed (BRAVO) having an outer antibody-containing layer.

TABLE 1

| ABOVE BODY WEIGHT SUMMARY |                 |                |                 |
|---------------------------|-----------------|----------------|-----------------|
| TREATMENT                 | 14 day weight   | 27 day weight  | 14-27 day gain  |
| Control                   | 0.66 kg         | 2.03 kg        | 1.37 kg         |
| Bravo                     | 0.63 kg         | 1.96 kg        | 1.33 kg         |
|                           |                 |                |                 |
|                           |                 |                |                 |
|                           |                 |                |                 |
| TREATMENT                 | 39 day weight   | 14-39 day gain |                 |
| Control                   | 3.15 kg         | 2.49 kg        |                 |
| Bravo                     | 3.23 kg         | 2.60 kg        |                 |
|                           |                 |                |                 |
| FEED CONVERSION DATA      |                 |                |                 |
| TREATMENT                 | 14-27 feed/bird | 0-27 feed/bw*  | 14-17 feed/gain |
| Control                   | 2.50 kg         | 0.558 kg       | 1.826 kg        |
| Bravo                     | 2.34 kg         | 0.541 kg       | 1.76 kg         |
|                           |                 |                |                 |
|                           |                 |                |                 |
| TREATMENT                 | 14-39 feed/bird | 0-39 feed/bw*  | 14-39 feed/gain |
| Control                   | 5.349 kg        | 0.781 kg       | 2.15 kg         |
| Bravo                     | 4.930 kg        | 0.695 kg       | 1.90 kg         |

\* bw = body weight

#### Example 4

A CCK antibody-containing powder made by the process of Example 1 were mixed with tallow to form a blend in which the powder was substantially encapsulated by the fat. The fat mixture was then spray coated upon the inner cores, as described in Example 2, at the indicated antibody levels.

Chickens were fed the animal feed and their biological responses were determined. Table 2 shows the results obtained in chickens fed the coated feed pellets (crumbles) for three weeks. Also shown are the results obtained when

chickens were fed a standard feed mash containing the indicated amounts of the anti-CCK antibody.

In the course of the trial, both the rate of body gain and the feed efficiency were markedly higher in chickens fed the antibody-coated pellets than in those fed antibody-containing mash. Surprisingly, a superior increase is observed (relative to control feed) when the antibody is provided on pellets than as a component of mash.

Table 2

| 10 | Treatment         | Week 1<br>Body Wt | Week 0-1<br>Body Wt<br>Gain | Feed/Bird<br>0-1<br>Consumed | Feed/Body<br>Wt | Feed/Body<br>Wt Gain |
|----|-------------------|-------------------|-----------------------------|------------------------------|-----------------|----------------------|
|    | Week 1 (Mash)     |                   |                             |                              |                 |                      |
|    | Control           | 132               | 93                          | 124                          | 0.938           | 1.344                |
| 15 | 0.075* Bravo      | 136               | 97                          | 132                          | 0.969           | 1.368                |
|    | 0.25 Bravo        | 138               | 98                          | 131                          | 0.947           | 1.338                |
|    | 0.75 Bravo        | 127               | 87                          | 125                          | 0.984           | 1.442                |
|    | Week 2 (Crumbles) |                   |                             |                              |                 |                      |
|    | Control           | 152               | 112                         | 143                          | 0.942           | 1.287                |
| 20 | 0.075 Bravo       | 149               | 108                         | 156                          | 1.049           | 1.450                |
|    | 0.25 Bravo        | 155               | 114                         | 141                          | 0.969           | 1.315                |
|    | 0.75 Bravo        | 147               | 107                         | 137                          | 0.928           | 1.273                |
|    | Week 2 (Mash)     |                   |                             |                              |                 |                      |
|    | Control           | 311               | 272                         | 384                          | 1.237           | 1.421                |
| 25 | 0.075 Bravo       | 329               | 290                         | 400                          | 1.218           | 1.386                |
|    | 0.25 Bravo        | 323               | 283                         | 396                          | 1.226           | 1.401                |
|    | 0.75 Bravo        | 291               | 251                         | 353                          | 1.244           | 1.451                |
|    | Week 2 (Crumbles) |                   |                             |                              |                 |                      |
|    | Control           | 366               | 325                         | 477                          | 1.243           | 1.390                |
| 30 | 0.075 Bravo       | 358               | 317                         | 457                          | 1.278           | 1.444                |
|    | 0.25 Bravo        | 358               | 317                         | 470                          | 1.314           | 1.485                |
|    | 0.75 Bravo        | 352               | 313                         | 413                          | 1.174           | 1.324                |
|    | Week 3 (Mash)     |                   |                             |                              |                 |                      |
|    | Control           | 624               | 584                         | 823                          | 1.316           | 1.406                |
| 35 | 0.075 Bravo       | 635               | 595                         | 845                          | 1.334           | 1.423                |
|    | 0.25 Bravo        | 608               | 568                         | 835                          | 1.375           | 1.473                |
|    | 0.75 Bravo        | 569               | 529                         | 787                          | 1.382           | 1.488                |
|    | Week 3 (Crumbles) |                   |                             |                              |                 |                      |
|    | Control           | 683               | 642                         | 936                          | 1.373           | 1.461                |
| 40 | 0.075 Bravo       | 697               | 656                         | 956                          | 1.372           | 1.457                |
|    | 0.25 Bravo        | 699               | 659                         | 971                          | 1.395           | 1.482                |
|    | 0.75 Bravo        | 687               | 648                         | 893                          | 1.299           | 1.379                |

\*grams of anti-CCK egg yolk per kilogram of feed.

#### Example 5

45 Ducks were fed a pelleted diet on which either 0.5% corn oil (control) or 0.5% conjugated linoleic acid was sprayed on the outer surface of the pellets. The coated pellets were fed to 14 day old ducks for 13 days. Feed conversion (feed



consumed per amount of gain) was determined from 14 to 27 days and 29 to 39 days of age.

Table 3

|   | <u>Treatment</u> | <u>14-27 day conversion</u> | <u>29-39 day conversion</u> |
|---|------------------|-----------------------------|-----------------------------|
| 5 | Control          | 1.82                        | 2.38                        |
|   | CLA              | 1.79                        | 2.14                        |

Feeding CLA from 14 to 27 days of age reduced feed conversion (pounds of feed per pound of gain). The effects of feeding pellets coated with CLA continued to have an effect even for the period between 29 to 39 days of age.

It will be apparent to those skilled in the art that the present invention can be used to prepare the animal feed for a wide variety of food animals or pets, including without limitation, ducks, chickens and turkeys.

It also will be readily apparent to those skilled in the art that a large number of changes and modifications can be made without departing from the spirit and scope of the present invention. Therefore, it is intended that the invention only be limited by the claims which follow.

# CLAIMS

We claim:

- Sub  
a1
- 09037690.031098
1. A method to improve the growth of an animal or the efficiency of an animal to convert feed into desired body tissue, said method comprising feeding an animal an effective amount of animal feed particles comprising an inner core of nutrients and having an outer surface, and a layer comprising antibodies on the outer surface of the inner core,  
said antibodies being antibodies that can passively immunize the animal against the adverse effects of an antigen which could reduce the animal's ability to grow or to efficiently convert its feed into desirable body tissue, wherein the method achieves superior growth or feed conversion than a second method wherein a comparable amount of the antibody is fed to the animal in an unpelleted form.
  2. A method of Claim 1 in which the antibodies are derived from a chicken egg.
  3. A method of Claim 1 in which the antibody layer comprises a fat.
  4. A method of Claim 3 in which the fat is one which protects the antibodies from adverse environmental conditions.
  5. A method of Claim 3 in which the fat is a mixture of a conjugated linoleic acid and another fat.
  3. A method of Claim 1 in which the antibody is anti-cholecystokinin antibody.

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7. A method to improve the growth of an animal or the efficiency of an animal to convert feed into desired body tissue, said method comprising feeding an animal an effective amount of animal feed particles comprising an inner core of nutrients and having an outer surface, and a layer comprising conjugated linoleic acid on the outer surface of the inner core.

Sub 2 8. A particulate animal feed comprising an inner core of nutrients, the core having an outer surface, and a layer of antibodies on the outer surface of the inner core.

6/5. A particulate animal feed as claimed in Claim 5 wherein the antibodies are anti-cholecystokinin antibodies.

10. A particulate animal feed comprising an inner core of nutrients, the core having an outer surface, and a layer of conjugated linoleic acid on the outer surface of the inner core.

add a<sup>3</sup>

add B<sub>1</sub>

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PTO/SB/01 (6-95)  
Approved for use through 9/30/98. OMB 0651-0032

Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

|  |                          |              |
|--|--------------------------|--------------|
| <b>0010/PTO</b><br>Rev. 3/98<br><br><b>U.S. Department of Commerce</b><br>Patent and Trademark Office<br><br><b>DECLARATION FOR</b><br><b>UTILITY OR DESIGN</b><br><b>PATENT APPLICATION</b><br><br><input checked="" type="checkbox"/> Declaration<br>Submitted<br>with Initial Filing<br><br>OR<br><br><input type="checkbox"/> Declaration<br>Submitted after<br>Initial Filing | Attorney Docket Number   | 960296.94011 |
|  | First Named Inventor     | Mark E. Cook |
|  | <b>COMPLETE IF KNOWN</b> |              |
|  | Application Number       |              |
|  | Filing Date              |              |
|  | Group Art Unit           |              |
|  | Examiner Name            |              |

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method of Improving the Growth or the Efficiency of Feed Conversion of an Animal and Compositions for Use Therein

(Title of the invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YY) \_\_\_\_\_

as United States Application Number or PCT International

Application Number \_\_\_\_\_ and was amended on (MM/DD/YY) \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate or § 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT International application having a filing date before that of the application on which priority is claimed.

| Prior Foreign Application Number(s) | Country | Foreign Filing Date (MM/DD/YY) | Priority Not Claimed     | Certified Copy Attached? |
|-------------------------------------|---------|--------------------------------|--------------------------|--------------------------|
|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |
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☐ Additional foreign applications numbers are listed on a supplemental priority sheet attached hereto:

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

| Application Number(s) | Filing Date (MM/DD/YY) | <input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority sheet attached hereto. |
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|                       |                        |  |

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| DECLARATION   |                               |   | Page 2                               |
|---|-------------------------------|---|--------------------------------------|
| I hereby claim benefit under Title 35, United States Code §120 of any United States application(s), or §365(C) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application or PCT international application in the manner provided in the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application. |                               |   |                                      |
| U.S. Parent Application Number  | PCT Parent Number             | Parent Filing Date (MM/DD/YY)   | Parent Patent Number (if applicable) |
| 08/684,785  |                               | 07/22/96  | 5,725,873                            |
| <input type="checkbox"/> Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto   |                               |   |                                      |
| As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and all continuation and divisional applications based thereon, and to transact all business in the Patent and Trademark Office connected therewith:  |                               |   |                                      |
| <input type="checkbox"/> Firm Name <span style="border: 1px solid black; display: inline-block; width: 150px; height: 1.2em; vertical-align: middle;"></span> Customer Number or label <span style="border: 1px solid black; display: inline-block; width: 100px; height: 1.2em; vertical-align: middle;"></span><br>OR<br><input checked="" type="checkbox"/> List attorney(s) and/or agent(s) name and registration number below  |                               |   |                                      |
| Name  | Registration Number           | Name  | Registration Number                  |
| Thad F. Kryshak   | <del>19,428</del>             | Gregory A. Nelson   | <del>30,577</del>                    |
| Neil Hamilton   | <del>19,869</del>             | Keith M. Baxter   | <del>31,233</del>                    |
| Thomas W. Ehrmann   | <del>20,374</del>             | John D. Franzini  | <del>31,356</del>                    |
| Berry E. Sammons  | <del>25,608</del>             | Joseph W. Bain  | <del>34,290</del>                    |
| J. Rodman Steele  | <del>25,931</del>             | Robert J. Sacco   | <del>35,657</del>                    |
| Nicholas J. Seay  | <del>27,386</del>             | Jean C. Baker   | <del>35,433</del>                    |
| George E. Haas  | <del>27,642</del>             | David G. Ryser  | <del>35,407</del>                    |
| Michael J. McGovern   | <del>28,326</del>             | Bennett J. Berson   | <del>37,094</del>                    |
| Carl R. Schwartz  | <del>29,437</del>             | Michael A. Jaskolski  | <del>37,551</del>                    |
| <input type="checkbox"/> Additional attorney(s) and/or agents named on a supplemental priority sheet attached hereto  |                               |   |                                      |
| Please direct all correspondence to <input type="checkbox"/> Customer Number <span style="border: 1px solid black; display: inline-block; width: 100px; height: 1.2em; vertical-align: middle;"></span>   |                               | OR <input checked="" type="checkbox"/> Fill in correspondence address below |                                      |
| Name <u>Bennett J. Berson</u>   |                               |   |                                      |
| Address <u>Quarles &amp; Brady</u>  |                               |   |                                      |
| Address <u>P O Box 2113</u>   |                               |   |                                      |
| City <u>Madison</u>   | State <u>WI</u>               | Zip <u>53701-2113</u>   |                                      |
| Country <u>US</u>   | Telephone <u>608/251-5000</u> | Fax <u>608/251-9166</u>   |                                      |
| I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.  |                               |   |                                      |
| Name of Sole or First Inventor:   |                               | A petition has been filed for this unsigned inventor                        |                                      |
| Given Name  | Middle                        | Family  | Suffix, e.g., Jr.                    |
| Mark  | E.                            | Cook  |                                      |
| Inventor's Signature  |                               | Date  |                                      |
|   |                               |   |                                      |
| Residence: City   | State                         | Country   | Citizenship                          |
| <u>Madison</u>  | <u>WI</u>                     | <u>US</u>   | <u>US</u>                            |
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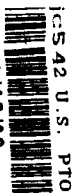
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| DECLARATION   |       |  |  |  |                             |             |    |  |             | ADDITIONAL INVENTOR(S)<br>Supplemental Sheet         |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
|---|-------|--|--|--|-----------------------------|-------------|----|--|-------------|--|--|----|--|---------|-------------------|-------|--|--|--|--|-------------|--|----|--|--|--|--|--------|--|--|--|
| Name of Additional Joint Inventor, if any:                                    |       |  |  |  |                             |             |    |  |             | A petition has been filed for this unsigned inventor |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Given Name  | Daria |  |  |  |                             | Middle Name | L. |  | Family Name | Jerome   |  |    |  |         | Suffix, e.g., Jr. |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Inventor's Signature  |       |  |  |  |                             |             |    |  |             | Date   |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
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| Name of Additional Joint Inventor, if any:                                    |       |  |  |  |                             |             |    |  |             | A petition has been filed for this unsigned inventor |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Given Name  |       |  |  |  |                             | Middle Name |    |  | Family Name |  |  |    |  |         | Suffix, e.g., Jr. |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Inventor's Signature  |       |  |  |  |                             |             |    |  |             | Date   |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
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| Name of Additional Joint Inventor, if any:                                    |       |  |  |  |                             |             |    |  |             | A petition has been filed for this unsigned inventor |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Given Name  |       |  |  |  |                             | Middle Name |    |  | Family Name |  |  |    |  |         | Suffix, e.g., Jr. |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Inventor's Signature  |       |  |  |  |                             |             |    |  |             | Date   |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
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| Name of Additional Joint Inventor, if any:                                    |       |  |  |  |                             |             |    |  |             | A petition has been filed for this unsigned inventor |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Given Name  |       |  |  |  |                             | Middle Name |    |  | Family Name |  |  |    |  |         | Suffix, e.g., Jr. |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Inventor's Signature  |       |  |  |  |                             |             |    |  |             | Date   |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |
| Residence: City   |       |  |  |  |                             |             |    |  |             | State  |  |    |  | Country |                   |       |  |  |  |  | Citizenship |  |    |  |  |  |  |        |  |  |  |
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| Additional inventors are being named on supplemental sheet(s) attached hereto |       |  |  |  |                             |             |    |  |             |  |  |    |  |         |                   |       |  |  |  |  |             |  |    |  |  |  |  |        |  |  |  |

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US 42 U.S. PTO

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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.UTILITY  
PATENT APPLICATION  
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 960296.94011

First Inventor or Application Identifier Mark E. Cook

Title Method of Improving the Growth or the Efficiency of Feed

Express Mail Label No. EE218789037US

## APPLICATION ELEMENTS

See MPEP Chapter 800 concerning utility patent application contents.

## ADDRESS TO:

Assistant Commissioner for Patents  
Box Patent Application  
Washington, D.C. 20231

- 1 ☒ Fee transmittal Form  
(Submit an original and a duplicate for fee processing)
- 2 ☒ Specification (Total Pages 13)  
(preferred arrangement set forth below)
- Descriptive title of the invention
  - Cross References to Related Applications
  - Statement Regarding Fed Sponsored R&D
  - Reference to Microfiche Appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure

- 3
- ☐
- Drawing(s) (35 USC 113) (Total Sheets
- ☐
- )

4. Oath or Declaration (Total Pages 3)

- a. ☐ Newly executed (original or copy)
- b. ☐ Copy from prior Application (37 CFR 1.63(d))  
(for continuation/divisional with Box 17 completed)  
(Note Box 5 below)

## DELETION OF INVENTOR(S)

i. ☐ Signed Statement attached deleting  
inventor(s) named in prior application,  
see 37 CFR 1.63(d)(2) and 1.33(b).

- 5 ☐ Incorporation By Reference (useable if Box 4b is checked)  
The entire disclosure of the prior application from  
which a copy of the oath or declaration is supplied  
under Box 4b, is considered as being part of the  
disclosure of the accompanying application and is  
hereby incorporated by reference herein.

- 6.
- ☐
- Microfiche Computer Program (Appendix)

7. Nucleotide and/or Amino Acid Sequence Submission
- 
- (if applicable, all necessary)

- a. ☐ Computer readable Copy
- b. ☐ Paper Copy (identical to computer copy)
- c. ☐ Statement Verifying identity of above

## ACCOMPANYING APPLICATION PARTS

- 8 ☐ Assignment Papers (cover sheet & documents)
- 9 ☐ 37 CFR 3.73(b) Statement (where there is an assignee) ☐ Power of Attorney
- 10 ☐ English Translation Document (if applicable)
- 11 ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
- 12 ☐ Preliminary Amendment
- 13 ☐ Return receipt postcard (MPEP 503)  
(Should be specifically itemized)
- 14 ☐ \*Small Entity Statement filed in prior application  
Statement(s) ☐ Status still proper and desired
- 15 ☐ Certified copy of priority Document(s)  
(if foreign priority is claimed)
- 16 ☐ Other:

\* A new statement is required to pay small entity fees, except where one has been filed in a prior application and is being relied upon

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application no. 08/684,785

Prior application information: Examiner: F. Vandervegt Group/Art Unit: 1816

## 18. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Labelor ☒ Correspondence address below

|         |                   |           |              |          |              |
|---------|-------------------|-----------|--------------|----------|--------------|
| NAME    | Bennett J. Berson |           |              |          |              |
|         | Quarles & Brady   |           |              |          |              |
| ADDRESS | P O Box 2113      |           |              |          |              |
| CITY    | Madison           | STATE     | WI           | ZIP CODE | 53701-2113   |
| COUNTRY | US                | TELEPHONE | 608/251-5000 | FAX      | 608/251-9166 |

|                   |                   |                                   |                |
|-------------------|-------------------|-----------------------------------|----------------|
| Name (Print/Type) | Bennett J. Berson | Registration No. (Attorney/Agent) | 37,094         |
| Signature         |                   | Date                              | March 10, 1998 |

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231.

DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231. QBMA156295

09037690.031098

**FEE TRANSMITTAL**

Patent fees are subject to annual revision on October 1.  
 These are the fees effective October 1, 1997.  
 Small Entity payments must be supported by a small entity statement  
 otherwise large entity fees must be paid, See Forms PTO/SB/09-12

**Complete if Known**

TOTAL AMOUNT OF PAYMENT \$ 872.00

Application Number

Filing Date

First Named Inventor

Mark E. Cook

Group Art Unit

1816

Examiner Name

Attorney Docket Number

960296.94011

**METHOD OF PAYMENT (check one)**

1. ☒ The Commissioner is hereby authorized to charge  
 indicated fees and credit any over payments to:

Deposit  
Account  
Number

17-0055

Deposit  
Account  
Name

Quarles &amp; Brady

☒Charge Any Additional  
Fee Required Under 37  
CFR 1.16 and 1.17☐Charge the Issue Fee Set in 37 CFR  
1.18 at the mailing of the Notice of  
Allowance, 37 CFR 1.31(b)

2. ☐ Payment Enclosed:

☐

Check

☐Money  
Order☐

Other

**FEE CALCULATION (fees effective 10/01/97)****1. FILING FEE**

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee Description        | Fee Paid |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------|----------|
| 101                         | 790                         | 201                         | 395                         | Utility filing fee     | 790.00   |
| 106                         | 330                         | 206                         | 165                         | Design filing fee      |          |
| 107                         | 540                         | 207                         | 270                         | Plant filing fee       |          |
| 108                         | 790                         | 208                         | 395                         | Reissue filing fee     |          |
| 114                         | 150                         | 214                         | 75                          | Provisional filing fee |          |

SUBTOTAL (1) (\$790.00)

**2. CLAIMS**

|                           | Extra  | Fee from<br>below | Fee Paid |
|---------------------------|--------|-------------------|----------|
| Total Claims 10           | -20**= | X                 |          |
| Independent Claims 4      | -3**=  | X 82              | 82.00    |
| Multiple Dependent Claims |        |                   |          |

\*\* or number previously paid, if greater, For reissues see below

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee Description  |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|
| 103                         | 22                          | 203                         | 11                          | Claims in excess of 20                                       |
| 102                         | 82                          | 202                         | 41                          | Independent claims in excess of 3                            |
| 104                         | 270                         | 204                         | 135                         | Multiple dependent claim                                     |
| 109                         | 80                          | 209                         | 40                          | **Reissue independent claims<br>over original patent         |
| 110                         | 22                          | 210                         | 11                          | **Reissue claims in excess of 20<br>and over original patent |

SUBTOTAL (2) (\$82.00)

**FEE CALCULATION (continued)****3. ADDITIONAL FEES**Large Entity  
Fee  
CodeSmall Entity  
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Other fee (specify)

Other fee (specify)

SUBTOTAL (3) (\$)

\* Reduced by Basic Filing Fee Paid

**SUBMITTED BY**Typed or  
Printed Name

Bennett J. Berson

Signature

Date

March 10, 1998

**Complete (if applicable)**

Reg. Number

37,094

Deposit Account  
User ID

QBMA01156298



Firststar Plaza  
P.O. Box 2113  
Madison, Wisconsin 53701-2113  
608/251-5000  
FAX 608/251-9166  
<http://www.quarles.com>

Attorneys at Law in  
Milwaukee and Madison, Wisconsin  
West Palm Beach and Naples, Florida  
Phoenix, Arizona

**Quarles & Brady**

March 10, 1998

Assistant Commissioner of Patents  
Box Patent Application  
Washington DC 20231

Re: Filing New Patent Application

Dear Sir:

Enclosed for filing please find a new patent application  
entitled: METHOD OF IMPROVING THE GROWTH OF THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN

by Mark E. Cook  
Daria L. Jerome

The undersigned hereby certifies that this document is being  
deposited with the United States Postal Service today, March 10,  
1998, by the "Express Mail" service, utilizing Express Mail label  
number EE218789037US, addressed to: Assistant Commissioner for  
Patents, Box Patent Application, Washington, DC 20231.

Please indicate receipt of this application by returning the  
attached postcard with the official Patent and Trademark Office  
receipt and serial number stamped thereon.

Respectfully submitted,



QBMAD\156301

09037690.031098



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

| APPLICATION NUMBER | FILING/RECEIPT DATE | FIRST NAMED APPLICANT | ATTORNEY DOCKET NO./TITLE |
|--------------------|---------------------|-----------------------|---------------------------|
| 09/037,690         | 03/10/98            | COOK                  | M 960296, 94011           |

BENNETT J. BERSON  
GUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

0232/0327

NOT ASSIGNED

1615

DATE MAILED:

03/27/98

**NOTICE TO FILE MISSING PARTS OF APPLICATION**  
*Filing Date Granted*

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.138(a). If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of ☐ \$65.00 for a small entity in compliance with 37 CFR 1.27, or ☐ \$130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.

If all required items on this form are filed within the period set above, the total amount owed by applicant as a  
☐ small entity (statement filed) ☐ non-small entity is \$ 130.00.

- ☐ 1. The statutory basic filing fee is:

- ☐ missing.  
☐ insufficient.

Applicant must submit \$ \_\_\_\_\_ to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

- ☐ 2. Additional claim fees of \$ \_\_\_\_\_, including any multiple dependent claim fees, are required.

\$ \_\_\_\_\_ for \_\_\_\_\_ independent claims over 3.

\$ \_\_\_\_\_ for \_\_\_\_\_ dependent claims over 20.

\$ \_\_\_\_\_ for multiple dependent claim surcharge.

Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

- ☐ 3. The oath or declaration:

- ☐ is missing or unexecuted.  
☐ does not cover the newly submitted items.  
☐ does not identify the application to which it applies.  
☐ does not include the city and state or foreign country of applicant's residence.

An oath or declaration in compliance with 37 CFR 1.63, including residence information and identifying the application by the above Application Number and Filing Date is required.

- ☒ 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

- ☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

- ☐ 6. A \$50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).  
☐ 7. Your filing receipt was mailed in error because your check was returned without payment.  
☐ 8. The application does not comply with the Sequence Rules.  
See attached "Notice to Comply with Sequence Rules 37 CFR 1.821-1.825."  
☐ 9. OTHER:

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

**A copy of this notice MUST be returned with the reply.**

Customer Service Center  
Initial Patent Examination Division (703) 308-1202

PART 3 - OFFICE COPY

Receipt

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date set forth below as First Class Mail in an envelope addressed to:  
Assistant Commissioner for Patents, Washington, D.C. 20231



Date of Signature and Deposit: April 30, 1998

*[Signature]*  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark E. Cook  
Daria L. Jerome

Date: April 30, 1998

Serial No.: 09/037,690

Group Art Unit: 1615

Filed: 03/10/98

Examiner:

For: METHOD OF IMPROVING THE  
GROWTH OR THE EFFICIENCY  
OF FEED CONVERSION OF AN  
ANIMAL AND COMPOSITIONS  
FOR USE THEREIN

File No.: 960296.94011  
(now 960296.95297)

REQUEST FOR CORRECTED FILING RECEIPT

Assistant Commissioner For Patents  
Application Processing Division  
Customers Correction Branch  
Washington DC 20231

RECEIVED

MAY 11 1998

Dear Sir:

Errors were noted in the Filing Receipt received in connection with the above-noted patent application.

The Filing Receipt lists only one of the two named inventors. The name of inventor Daria L. Jerome was omitted. Both inventors were named on the Declaration filed with the application.

In the title, the word "Improving" is spelled incorrectly.

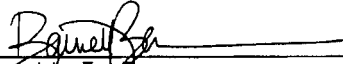
The Filing Receipt indicates that no filing fee was received. However, the PTO was authorized to charge the \$872.00 filing fee to our firm deposit account according to the fee transmittal form submitted with the application. It

is believed that the fee was paid since the Notice of File Missing Parts of Application does not request any additional filing fee.

A copy of the Filing Receipt with the changes noted thereon is attached.

A corrected Filing Receipt is respectfully requested.

Respectfully submitted,

  
Bennett J. Gerson  
Reg. No. 37,094  
Attorney for Applicants  
QUARLES & BRADY  
P.O. Box 2113  
Madison, WI 53701-2113  
(608) 251-5000

QBMAD\160031

|   |  |                          |              |
|---|--|--------------------------|--------------|
| <b>FEE TRANSMITTAL</b><br>Patent fees are subject to annual revision on October 1.<br>Small entity payments must be supported by a small entity statement<br>otherwise large entity fees must be paid. See Forms PTO/SB/09-12 |  | <b>Complete if Known</b> |              |
|   |  | Application Number       | 09/037,690   |
|   |  | Filing Date              | 03/10/98     |
|   |  | First Named Inventor     | Mark E. Cook |
|   |  | Group Art Unit           | 1615         |
| TOTAL AMOUNT OF PAYMENT \$  |  | Examiner Name            |              |
|   |  | Attorney Docket Number   | 960296.94011 |

| <b>METHOD OF PAYMENT (check one)</b>   |                       | <b>FEE CALCULATION (continued)</b>  |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
|--|-----------------------|---|----------|--|-----------------------|----------------|----------|-----------------|----------|-----|-----|------|-----|-------------------------------------|--|---------------------------|-----|-----|-----|--|--|-----|-----|-----------------------|-----------------------|---------------------------|----------|-----------------|-------|-----|-------|--|------------------------|-----|------|-----|------|--|-----|-------------------|--------|-----|--------------------------|---|----|-----|-----|---|-----|--|-----|-----|---|-------------------|-----|---|--|-----|-----|-----|-----|--|--|-----|-------|-----|-----|---|--|-----|-------|-----|-------|--|--|-----|-----|-----|-----|------------------|--|-----|-----|-----|-----|--|--|-----|-----|-----|-----|--------------------------|--|-----|-------|-----|-------|---|--|-----|-----|-----|----|--|--|-----|-------|-----|-----|--|--|-----|-------|-----|-----|--------------------------------|--|-----|-----|-----|-----|------------------|--|-----|-----|-----|-----|-----------------|--|-----|-----|-----|-----|-------------------------------|--|-----|----|-----|----|---|--|-----|-----|-----|-----|---|--|-----|----|-----|----|--|--|-----|-----|-----|-----|---|--|-----|-----|-----|-----|--|--|---------------------------|--|--|--|--|--|---------------------------|--|--|--|--|--|-------------------|--|--|--|--|--|
| 1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:<br>Deposit Account Number: 17-0055<br>Deposit Account Name: Quarles & Brady<br><input checked="" type="checkbox"/> Charge Any Additional Fee required Under 37 CFR 1.16 and 1.17 <input type="checkbox"/> Charge the Issue Fee Set in 37 CFR 1.16 at the Mailing of the Notice of Allowance, 37 CFR 1.311(b)  |                       | 3. ADDITIONAL FEES<br><table border="1"> <thead> <tr> <th>Large Entity Fee Code</th> <th>Small Entity Fee Code</th> <th>Fee (\$)</th> <th>Fee (\$)</th> <th>Fee Description</th> <th>Fee</th> </tr> </thead> <tbody> <tr><td>105</td><td>130</td><td>205</td><td>65</td><td>Surcharge - late filing fee or oath</td><td></td></tr> <tr><td>127</td><td>50</td><td>227</td><td>25</td><td>Surcharge - late provisional filing fee or cover sheet</td><td></td></tr> <tr><td>139</td><td>130</td><td>139</td><td>130</td><td>Non-English specification</td><td></td></tr> <tr><td>147</td><td>2,520</td><td>147</td><td>2,520</td><td>For filing a request for reexamination</td><td></td></tr> <tr><td>112</td><td>*920</td><td>112</td><td>*920</td><td>Requesting publication of SIR prior to Examiner action</td><td></td></tr> <tr><td>113</td><td>*1,840</td><td>113</td><td>*1,840</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr> <tr><td>115</td><td>110</td><td>215</td><td>55</td><td>Extension for reply within first month</td><td></td></tr> <tr><td>116</td><td>400</td><td>216</td><td>200</td><td>Extension for reply within second month</td><td></td></tr> <tr><td>117</td><td>950</td><td>217</td><td>475</td><td>Extension for reply within third month</td><td></td></tr> <tr><td>118</td><td>1,510</td><td>218</td><td>755</td><td>Extension for reply within fourth month</td><td></td></tr> <tr><td>128</td><td>2,060</td><td>228</td><td>1,030</td><td>Extension for reply within fifth month</td><td></td></tr> <tr><td>119</td><td>310</td><td>219</td><td>155</td><td>Notice of Appeal</td><td></td></tr> <tr><td>120</td><td>310</td><td>220</td><td>155</td><td>Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>270</td><td>221</td><td>135</td><td>Request for oral hearing</td><td></td></tr> <tr><td>138</td><td>1,510</td><td>138</td><td>1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr> <tr><td>140</td><td>110</td><td>240</td><td>65</td><td>Petition to revive unavoidably abandoned application</td><td></td></tr> <tr><td>141</td><td>1,320</td><td>241</td><td>660</td><td>Petition to revive unintentionally abandoned application</td><td></td></tr> <tr><td>142</td><td>1,320</td><td>242</td><td>660</td><td>Utility issue fee (or reissue)</td><td></td></tr> <tr><td>143</td><td>450</td><td>243</td><td>225</td><td>Design issue fee</td><td></td></tr> <tr><td>144</td><td>670</td><td>244</td><td>335</td><td>Plant issue fee</td><td></td></tr> <tr><td>122</td><td>130</td><td>122</td><td>130</td><td>Petitions to the Commissioner</td><td></td></tr> <tr><td>123</td><td>50</td><td>123</td><td>50</td><td>Petitions related to provisional applications</td><td></td></tr> <tr><td>126</td><td>240</td><td>126</td><td>240</td><td>Submission of Information Disclosure Stmt</td><td></td></tr> <tr><td>581</td><td>40</td><td>581</td><td>40</td><td>Recording each patent assignment per property (times number of properties)</td><td></td></tr> <tr><td>146</td><td>790</td><td>246</td><td>395</td><td>Filing a submission after final rejection (37 CFR 1.129(a))</td><td></td></tr> <tr><td>149</td><td>790</td><td>249</td><td>395</td><td>For each additional invention to be examined (37 CFR 1.129(b))</td><td></td></tr> <tr><td colspan="5">Other fee (specify) _____</td><td></td></tr> <tr><td colspan="5">Other fee (specify) _____</td><td></td></tr> <tr><td colspan="5">SUBTOTAL (3) (\$)</td><td></td></tr> </tbody> </table> |          | Large Entity Fee Code  | Small Entity Fee Code | Fee (\$)       | Fee (\$) | Fee Description | Fee      | 105 | 130 | 205  | 65  | Surcharge - late filing fee or oath |  | 127                       | 50  | 227 | 25  | Surcharge - late provisional filing fee or cover sheet           |  | 139 | 130 | 139                   | 130                   | Non-English specification |          | 147             | 2,520 | 147 | 2,520 | For filing a request for reexamination |                        | 112 | *920 | 112 | *920 | Requesting publication of SIR prior to Examiner action |     | 113               | *1,840 | 113 | *1,840                   | Requesting publication of SIR after Examiner action |    | 115 | 110 | 215   | 55  | Extension for reply within first month |     | 116 | 400   | 216               | 200 | Extension for reply within second month |  | 117 | 950 | 217 | 475 | Extension for reply within third month |  | 118 | 1,510 | 218 | 755 | Extension for reply within fourth month |  | 128 | 2,060 | 228 | 1,030 | Extension for reply within fifth month |  | 119 | 310 | 219 | 155 | Notice of Appeal |  | 120 | 310 | 220 | 155 | Filing a brief in support of an appeal |  | 121 | 270 | 221 | 135 | Request for oral hearing |  | 138 | 1,510 | 138 | 1,510 | Petition to institute a public use proceeding |  | 140 | 110 | 240 | 65 | Petition to revive unavoidably abandoned application |  | 141 | 1,320 | 241 | 660 | Petition to revive unintentionally abandoned application |  | 142 | 1,320 | 242 | 660 | Utility issue fee (or reissue) |  | 143 | 450 | 243 | 225 | Design issue fee |  | 144 | 670 | 244 | 335 | Plant issue fee |  | 122 | 130 | 122 | 130 | Petitions to the Commissioner |  | 123 | 50 | 123 | 50 | Petitions related to provisional applications |  | 126 | 240 | 126 | 240 | Submission of Information Disclosure Stmt |  | 581 | 40 | 581 | 40 | Recording each patent assignment per property (times number of properties) |  | 146 | 790 | 246 | 395 | Filing a submission after final rejection (37 CFR 1.129(a)) |  | 149 | 790 | 249 | 395 | For each additional invention to be examined (37 CFR 1.129(b)) |  | Other fee (specify) _____ |  |  |  |  |  | Other fee (specify) _____ |  |  |  |  |  | SUBTOTAL (3) (\$) |  |  |  |  |  |
| Large Entity Fee Code  | Small Entity Fee Code | Fee (\$)  | Fee (\$) | Fee Description  | Fee                   |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 105  | 130                   | 205   | 65       | Surcharge - late filing fee or oath  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 127  | 50                    | 227   | 25       | Surcharge - late provisional filing fee or cover sheet                     |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 139  | 130                   | 139   | 130      | Non-English specification  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 147  | 2,520                 | 147   | 2,520    | For filing a request for reexamination                                     |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 112  | *920                  | 112   | *920     | Requesting publication of SIR prior to Examiner action                     |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 113  | *1,840                | 113   | *1,840   | Requesting publication of SIR after Examiner action                        |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 115  | 110                   | 215   | 55       | Extension for reply within first month                                     |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 116  | 400                   | 216   | 200      | Extension for reply within second month                                    |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 117  | 950                   | 217   | 475      | Extension for reply within third month                                     |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 118  | 1,510                 | 218   | 755      | Extension for reply within fourth month                                    |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 128  | 2,060                 | 228   | 1,030    | Extension for reply within fifth month                                     |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 119  | 310                   | 219   | 155      | Notice of Appeal   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 120  | 310                   | 220   | 155      | Filing a brief in support of an appeal                                     |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 121  | 270                   | 221   | 135      | Request for oral hearing   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 138  | 1,510                 | 138   | 1,510    | Petition to institute a public use proceeding                              |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 140  | 110                   | 240   | 65       | Petition to revive unavoidably abandoned application                       |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 141  | 1,320                 | 241   | 660      | Petition to revive unintentionally abandoned application                   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 142  | 1,320                 | 242   | 660      | Utility issue fee (or reissue)   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 143  | 450                   | 243   | 225      | Design issue fee   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 144  | 670                   | 244   | 335      | Plant issue fee  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 122  | 130                   | 122   | 130      | Petitions to the Commissioner  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 123  | 50                    | 123   | 50       | Petitions related to provisional applications                              |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 126  | 240                   | 126   | 240      | Submission of Information Disclosure Stmt                                  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 581  | 40                    | 581   | 40       | Recording each patent assignment per property (times number of properties) |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 146  | 790                   | 246   | 395      | Filing a submission after final rejection (37 CFR 1.129(a))                |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 149  | 790                   | 249   | 395      | For each additional invention to be examined (37 CFR 1.129(b))             |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| Other fee (specify) _____  |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| Other fee (specify) _____  |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| SUBTOTAL (3) (\$)  |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 2. <input type="checkbox"/> Payment Enclosed:<br><input type="checkbox"/> Check <input type="checkbox"/> Money Order <input type="checkbox"/> Other  |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| <b>FEE CALCULATION (fees effective 10/01/97)</b>   |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 1. FILING FEE<br><table border="1"> <thead> <tr> <th>Large Entity Fee Code</th> <th>Small Entity Fee Code</th> <th>Fee (\$)</th> <th>Fee (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>101</td><td>790</td><td>201</td><td>395</td><td>Utility filing fee</td><td></td></tr> <tr><td>106</td><td>330</td><td>206</td><td>165</td><td>Design filing fee</td><td></td></tr> <tr><td>107</td><td>540</td><td>207</td><td>270</td><td>Plant filing fee</td><td></td></tr> <tr><td>108</td><td>790</td><td>208</td><td>395</td><td>Reissue filing fee</td><td></td></tr> <tr><td>114</td><td>150</td><td>214</td><td>75</td><td>Provisional filing fee</td><td></td></tr> <tr><td colspan="5">SUBTOTAL (1) (\$)</td><td></td></tr> </tbody> </table>  |                       |   |          | Large Entity Fee Code  | Small Entity Fee Code | Fee (\$)       | Fee (\$) | Fee Description | Fee Paid | 101 | 790 | 201  | 395 | Utility filing fee                  |  | 106                       | 330 | 206 | 165 | Design filing fee  |  | 107 | 540 | 207                   | 270                   | Plant filing fee          |          | 108             | 790   | 208 | 395   | Reissue filing fee                     |                        | 114 | 150  | 214 | 75   | Provisional filing fee                                 |     | SUBTOTAL (1) (\$) |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| Large Entity Fee Code  | Small Entity Fee Code | Fee (\$)  | Fee (\$) | Fee Description  | Fee Paid              |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 101  | 790                   | 201   | 395      | Utility filing fee   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 106  | 330                   | 206   | 165      | Design filing fee  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 107  | 540                   | 207   | 270      | Plant filing fee   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 108  | 790                   | 208   | 395      | Reissue filing fee   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 114  | 150                   | 214   | 75       | Provisional filing fee   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| SUBTOTAL (1) (\$)  |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 2. CLAIMS<br><table border="1"> <thead> <tr> <th>Total Claims</th> <th>Extra</th> <th>Fee from below</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr> <td>20***</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>3***</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td colspan="4">Multiple Dependent Claims</td> </tr> <tr> <td colspan="4">** or number previously paid, if greater. For reissues see below</td> </tr> <tr> <th>Large Entity Fee Code</th> <th>Small Entity Fee Code</th> <th>Fee (\$)</th> <th>Fee (\$)</th> <th>Fee Description</th> </tr> <tr><td>103</td><td>22</td><td>203</td><td>11</td><td>Claims in excess of 20</td></tr> <tr><td>102</td><td>82</td><td>202</td><td>41</td><td>Independent claims in excess of 3</td></tr> <tr><td>104</td><td>270</td><td>204</td><td>135</td><td>Multiple dependent claim</td></tr> <tr><td>109</td><td>80</td><td>209</td><td>40</td><td>**Reissue independent claims over original patent</td></tr> <tr><td>110</td><td>22</td><td>210</td><td>11</td><td>**Reissue claims in excess of 20 and over original patent</td></tr> <tr><td colspan="5">SUBTOTAL (2) (\$)</td></tr> </tbody> </table> |                       |   |          | Total Claims   | Extra                 | Fee from below | Fee Paid | 20***           | X        |     |     | 3*** | X   |                                     |  | Multiple Dependent Claims |     |     |     | ** or number previously paid, if greater. For reissues see below |  |     |     | Large Entity Fee Code | Small Entity Fee Code | Fee (\$)                  | Fee (\$) | Fee Description | 103   | 22  | 203   | 11                                     | Claims in excess of 20 | 102 | 82   | 202 | 41   | Independent claims in excess of 3                      | 104 | 270               | 204    | 135 | Multiple dependent claim | 109   | 80 | 209 | 40  | **Reissue independent claims over original patent | 110 | 22                                     | 210 | 11  | **Reissue claims in excess of 20 and over original patent | SUBTOTAL (2) (\$) |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| Total Claims   | Extra                 | Fee from below  | Fee Paid |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 20***  | X                     |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 3***   | X                     |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| Multiple Dependent Claims  |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| ** or number previously paid, if greater. For reissues see below   |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| Large Entity Fee Code  | Small Entity Fee Code | Fee (\$)  | Fee (\$) | Fee Description  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 103  | 22                    | 203   | 11       | Claims in excess of 20   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 102  | 82                    | 202   | 41       | Independent claims in excess of 3  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 104  | 270                   | 204   | 135      | Multiple dependent claim   |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 109  | 80                    | 209   | 40       | **Reissue independent claims over original patent                          |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| 110  | 22                    | 210   | 11       | **Reissue claims in excess of 20 and over original patent                  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |
| SUBTOTAL (2) (\$)  |                       |   |          |  |                       |                |          |                 |          |     |     |      |     |                                     |  |                           |     |     |     |  |  |     |     |                       |                       |                           |          |                 |       |     |       |  |                        |     |      |     |      |  |     |                   |        |     |                          |   |    |     |     |   |     |  |     |     |   |                   |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                           |  |  |  |  |  |                           |  |  |  |  |  |                   |  |  |  |  |  |

|                       |                   |                                 |                |
|-----------------------|-------------------|---------------------------------|----------------|
| <b>SUBMITTED BY</b>   |                   | <b>Complete (if applicable)</b> |                |
| Typed or Printed Name | Bennett J. Berson | Reg. Number                     | 37,094         |
| Signature             |                   | Date                            | April 30, 1998 |
|                       |                   | Deposit Account                 | User ID        |

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| 09/037,690         | 03/10/98    | 1615         | \$0.00        | 960296.94011        | 0     | 10     | 4      |

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BENNETT J. BERSON  
QUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

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METHOD OF IMPROVING THE GROWTH OR THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN

PRELIMINARY CLASS: 424

(see reverse)

|  |   |                        |  |                                     |                         |
|--|---|------------------------|--|-------------------------------------|-------------------------|
| SERIAL NUMBER<br>09/037,690  | FILING DATE<br>03/10/98   | CLASS<br>424           | GROUP ART UNIT<br>1644   | ATTORNEY DOCKET NO.<br>960296.94011 |                         |
| <b>APPLICANT</b><br>MARK E. COOK, MADISON, WI; DARIA L. JEROME, FRAZEE, MN.<br><br><b>**CONTINUING DOMESTIC DATA*****</b><br>VERIFIED THIS APPLN IS A CIP OF 08/684,785 07/22/96 PAT 5,725,873<br><u>RV</u><br><br><b>**371 (NAT'L STAGE) DATA*****</b><br>VERIFIED <u>NONE</u><br><u>RV</u><br><br><b>**FOREIGN APPLICATIONS*****</b><br>VERIFIED <u>NONE</u><br><u>RV</u><br><br>FOREIGN FILING LICENSE GRANTED 03/27/98 |   |                        |  |                                     |                         |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>35 USC 119 (a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Met after Allowance<br>Verified and Acknowledged <u>RV</u><br>Examiner's Initials _____ Initials _____  |   | STATE OR COUNTRY<br>WI | SHEETS DRAWING<br>0  | TOTAL CLAIMS<br>10                  | INDEPENDENT CLAIMS<br>4 |
| <b>ADDRESS:</b><br>BENNETT J. BERSON<br>QUARLES & BRADY<br>PO BOX 2113<br>MADISON WI 53701-2113  |   |                        |  |                                     |                         |
| <b>TITLE:</b><br>METHOD OF IMPROOVING THE GROWTH OR THE EFFICIENCY OF FEED<br>CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN   |   |                        |  |                                     |                         |
| FILING FEE RECEIVED<br><br>\$1,002   | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>NO. _____ for the following: |                        | <input type="checkbox"/> All Fees<br><input checked="" type="checkbox"/> 1.16 Fees (Filing)<br><input checked="" type="checkbox"/> 1.17 Fees (Processing Ext. of time)<br><input checked="" type="checkbox"/> 1.18 Fees (Issue)<br><input type="checkbox"/> Other _____<br><input type="checkbox"/> Credit |                                     |                         |



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
| 09/037,690      | 03/10/98    | COOK                 | M 960295-94011      |

BENNETT J. BERSON  
QUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

HM11/0604

EXAMINER

VANDERVEGT, F

ART UNIT

1644

PAPER NUMBER

3

DATE MAILED:

06/04/98

Please find below and/or attached an Office communication concerning this application or proceeding. \_\_\_\_\_

Commissioner of Patents and Trademarks



|                              |   |                                   |
|------------------------------|---|-----------------------------------|
| <b>Office Action Summary</b> | Application No.<br><b>09/037,890</b>    | Applicant(s)<br><b>Cook et al</b> |
|                              | Examiner<br><b>F. Pierre VanderVegt</b> | Group Art Unit<br><b>1644</b>     |

☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), ~~or thirty days, whichever is longer~~, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

**Disposition of Claims**

☒ Claim(s) 1-10 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-10 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

**Application Papers**

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

#### DETAILED ACTION

This application is a continuation of application S.N. 08/684,785. The status of the parent application should be amended at page 1 of the specification.

Claims 1-10 are pending in this application.

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#### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

15 A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

20 2. Claims 8 and 9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 5,726,873 (A on form PTO-892). Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 of the '873 patent is drawn to a particulate animal feed comprising an inner core of nutrients, specifically incorporating carbohydrates and protein, while the instant  
25 claims are drawn merely to the inner core of nutrients. The '873 further comprises an outer layer comprising anti-cholecystokinin antibodies, the same as instant claim 9, which is a specific embodiment of instant claim 8. The instantly recited feature of an "outer surface" is merely an inherent property of any solid particle and carries no patentable distinction over the invention of the '873 patent. The instant claims 8 and 9 clearly encompass the invention of claim 1 of the '873  
30 patent and are not patentably distinct therefrom.

*Claim Rejections - 35 USC § 112*

3. Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for providing animals with antibody to cholecystokinin (CCK), does not reasonably provide enablement for passively immunizing an animal against antigens which could  
5 reduce the animal's ability to grow or to efficiently convert its feed into desirable body tissue. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The specification discloses immunization of hens with CCK and feeding the antibodies to CCK obtained from their eggs to ducks. CCK is a natural peptide secreted by the mucosa of the  
10 upper intestine which stimulates contraction of the gall bladder and secretion of pancreatic enzymes which are desirable events in the digestion process. The specification further does not provide guidance how to determine antigens which could reduce the animal's ability to grow or to efficiently convert its feed into desirable body tissue. Given the nature of the invention, which is to enhance the digestive process, it would require undue experimentation on the part of a skilled  
15 artisan to determine which other antigens that are active in digestive processes would be suitable as targets for antibodies which are administered orally by the method of the present invention. Further, the specification provides no guidance as to which antigens to which the animal is exposed from external sources would be suitable immunogens for use in the present invention.

In view of the quantity of experimentation necessary, the limited working examples, the  
20 unpredictability of the art, the lack of sufficient guidance in the specification and the nature of the invention, it would take undue trials and errors to practice the claimed invention and this is not sanctioned by the statute.

*Claim Rejections - 35 USC § 103*

25 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5 This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(C) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 1-5, 7-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook et al, U.S. Patent 5,428,072 (B), in view of Tokoro et al, U. S. Patent 5,080,895 (C), Albright et al (U) and Ludington et al, U.S. Patent 3,119,691 (D).

15 The '072 patent teaches a method and composition to improve the efficiency of feed conversion in an animal comprising adding to the feed of the animal an effective amount of conjugated linoleic acid (CLA; Abstract and column 1, lines 54-68 in particular). The '072 patent further shows that chicks fed the CLA as a supplement required less standard poultry feed for equivalent weight gain to controls receiving unsupplemented standard poultry feed (Example 1 in particular). The '072 patent also teaches that the CLA had to be mixed with the feed on a daily basis (Examples 2 & 3 in particular). The '072 patent does not teach antibodies encapsulated in fat as a coating for feed particles. The '895 patent teaches a method for immunizing female chickens with an antigen, such as a pathogenic bacteria, and obtaining an antibody preparation to said antigen from the eggs of the chickens which is processed into a dry powder (Example 1 in particular). The '895 patent further teaches that this preparation is useful for protecting animals from the pathogen used to immunize the chicken and exemplifies this by feeding the preparation to neonatal pigs (Example III in particular). The combination of references does not teach encapsulation of the antibody or CLA in protective fat as a coating for food particles. Albright et al teaches the encapsulation of vitamin A, another dietary supplement, in a lipid composition which protects the vitamin A from mineral catalyzed degradation and hydrolysis for extended periods of time (see entire document). The combination of references does not teach coating of feed particles. The '691 patent teaches coating animal food particles by spraying with fat which

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melts when warmed but solidifies at room temperature (column 4, line 66 through column 5, line 22 in particular). The '691 patent also teaches that said fat may have a powder dispersed in it (column 5, lines 31-37 in particular). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to combine the anti-pathogen antibodies of the '895 patent and the feed conversion enhancing CLA of the '072 patent with the protective fat coating taught by Albright et al and spray the mixture as a coating on an animal feed product. One would have been motivated to combine these teachings with a reasonable expectation of success by the desire to protect animals, such as a commercial livestock, from specific pathogens using easily produced and prepared antibodies to the pathogen and protect the antibody molecules from degradative forces during storage using fat encapsulation. One would have been further motivated to add the CLA in order to reduce the amount of feed required by the animals to thrive and to apply the mixture directly to the food particles as a coating in order to control the amount of supplement delivered to the animals relative to the amount of food given, without having to mix each time the animals are fed and non-intake of the supplements due to settling of powders out of pelletized foods. Motivation to provide these supplements as a coating, rather than admixed directly with the nutrients of the food pellet, is provided by the fact that some animal feed products must be heated during processing to temperatures which would destroy the antibodies.

20

#### *Conclusion*

5. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which Applicant may become aware in the specification.
- 25 6. The Group and Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1644.

7. Papers related to this application may be submitted to Technology Center 1600, Group 1640 by facsimile transmission. Papers should be faxed to Group 1640 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The fax phone number for official documents to be entered into the record for Art Unit 1644 is (703)305-3014.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to F. Pierre VanderVegt, whose telephone number is (703)305-6997. The Examiner can normally be reached Monday through Friday from 8:00 am to 4:30 pm ET. a message may be left on the Examiner's voice mail service. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Ms. Christina Chan can be reached at (703)308-3973. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1600 receptionist, whose telephone number is (703)308-0196.

June 3, 1998  
F. Pierre VanderVegt, Ph.D.  
Patent Examiner  
Art Unit 1644

*David A. Saunders*  
DAVID SAUNDERS  
PRIMARY EXAMINER  
ART UNIT 182 1644

|                                   |  |  |                                  |  |                            |  |
|-----------------------------------|--|--|----------------------------------|--|----------------------------|--|
| <b>Notice of References Cited</b> |  |  | Application No.<br>09/037,690    |  | Applicant(s)<br>Cook et al |  |
|                                   |  |  | Examiner<br>F. Pierre VanderVegt |  | Group Art Unit<br>1644     |  |
| Page 1 of 1                       |  |  |                                  |  |                            |  |

| U.S. PATENT DOCUMENTS |              |         |                 |  |       |          |
|-----------------------|--------------|---------|-----------------|--|-------|----------|
|                       | DOCUMENT NO. | DATE    | NAME            |  | CLASS | SUBCLASS |
| A                     | 5,725,873    | 3/10/98 | Cook et al      |  | 424   | 442      |
| B                     | 5,428,072    | 6/27/95 | Cook et al      |  | 514   | 460      |
| C                     | 5,080,895    | 1/14/92 | Tokoro          |  | 424   | 85.8     |
| D                     | 3,119,691    | 1/28/84 | Ludington et al |  | 99    | 2        |
| E                     |              |         |                 |  |       |          |
| F                     |              |         |                 |  |       |          |
| G                     |              |         |                 |  |       |          |
| H                     |              |         |                 |  |       |          |
| I                     |              |         |                 |  |       |          |
| J                     |              |         |                 |  |       |          |
| K                     |              |         |                 |  |       |          |
| L                     |              |         |                 |  |       |          |
| M                     |              |         |                 |  |       |          |

| FOREIGN PATENT DOCUMENTS |              |      |         |      |       |          |
|--------------------------|--------------|------|---------|------|-------|----------|
|                          | DOCUMENT NO. | DATE | COUNTRY | NAME | CLASS | SUBCLASS |
| N                        |              |      |         |      |       |          |
| O                        |              |      |         |      |       |          |
| P                        |              |      |         |      |       |          |
| Q                        |              |      |         |      |       |          |
| R                        |              |      |         |      |       |          |
| S                        |              |      |         |      |       |          |
| T                        |              |      |         |      |       |          |

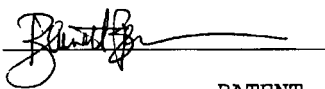
  

| NON-PATENT DOCUMENTS |   |      |
|----------------------|---|------|
|                      | DOCUMENT (Including Author, Title, Source, and Pertinent Pages) | DATE |
| U                    | Albright, RB et al. Drug. Dev. Ind. Pharm. 20(12):2035-2039.    | 7/94 |
| V                    |   |      |
| W                    |   |      |
| X                    |   |      |

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date set forth below as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.



Date of Signature and Deposit: May 27, 1998

  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark E. Cook  
Daria L. Jerome

Date: May 27, 1998

Serial No.: 09/037,690

Group Art Unit: 1615

Filed: 03/10/98

Examiner:

For: METHOD OF IMPROVING THE  
GROWTH OR THE EFFICIENCY  
OF FEED CONVERSION OF AN  
ANIMAL AND COMPOSITIONS  
FOR USE THEREIN

File No.: 960296.94011  
(now 960296.95297)

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION  
FILING DATE GRANTED

Assistant Commissioner for Patents  
Attention: Box Missing Parts  
Washington, D.C. 20231

Dear Sir:

In a Notice to File Missing Parts of Application mailed March 27, 1998, the applicants were given two months from the mailing date to file all required items and pay the required fees.

The Notice indicated that the signature to the Declaration was by a person other than the inventor or other qualified person. In fact, the Declaration submitted with the application was unsigned. It is believed that the Notice to File Missing Parts is in error in that an improper box on the form was checked.

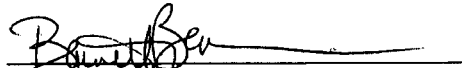


In any event, the applicants submit herewith Declarations of inventors Mark E. Cook and Daria L. Jerome, executed in counterparts.

A surcharge, set forth in 37 C.F.R. §1.16(e) believed to be \$130, is due in connection with this submission. Please charge the fee to Deposit Account No. 17-0055. No other fee is believed due in connection with this response.

It is believed that all missing parts are now on file.

Respectfully submitted,



Bennett J. Berson  
Reg. No. 37,094  
Attorney for Applicants  
QUARLES & BRADY  
P.O. Box 2113  
Madison, WI 53701-2113

(608) 251-5000

QBMAD\161987



PTO/SB/01 (6-95)  
Approved for use through 9/30/98. OMB 0651-0032

Please type a plus sign (+) inside this box ☐

Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

|  |                          |              |
|--|--------------------------|--------------|
| <b>0010/PTD</b><br>Rev. 6/98<br><br><b>U.S. Department of Commerce</b><br>Patent and Trademark Office<br><br><b>DECLARATION FOR</b><br><b>UTILITY OR DESIGN</b><br><b>PATENT APPLICATION</b><br><br><input type="checkbox"/> Declaration<br>Submitted<br>with Initial Filing<br><br>OR<br><br><input checked="" type="checkbox"/> Declaration<br>Submitted after<br>Initial Filing | Attorney Docket Number   | 960296.94011 |
|  | First Named Inventor     | Mark E. Cook |
|  | <b>COMPLETE IF KNOWN</b> |              |
|  | Application Number       | 09/037,690   |
|  | Filing Date              | 03/10/98     |
|  | Group Art Unit           |              |
| Examiner Name  |                          |              |

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method of Improving the Growth or the Efficiency of Feed Conversion of an Animal and Compositions for Use Therein

(Title of the invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YY)

03/10/98

as United States Application Number or PCT International

Application Number

09/037,690

and was amended on (MM/DD/YY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate or §365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT International application having a filing date before that of the application on which priority is claimed.

| Prior Foreign Application Number(s) | Country | Foreign Filing Date (MM/DD/YY) | Priority Not Claimed     | Certified Copy Attached? |
|-------------------------------------|---------|--------------------------------|--------------------------|--------------------------|
|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |
|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |
|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |
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|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |

☐ Additional foreign applications numbers are listed on a supplemental priority sheet attached hereto:

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

| Application Number(s) | Filing Date (MM/DD/YY) |  |
|-----------------------|------------------------|--|
|                       |                        | <input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority sheet attached hereto. |

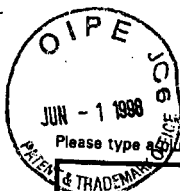
Burden Hour Statement: This form is estimated to take .4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231. OBMAD/156284

Please type a plus sign (+) inside this box ☐

| DECLARATION   |                     |                               | Page 2  |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
|---|---------------------|-------------------------------|---|---------|---------------------------------|---------------------|-------|---|-----------------|---------------------|-------------------|--------|---------------|--------|-----------------|--------------|-------------------|--------|------------------|--------|------------------|--------|----------------|--------|------------------|--------|-----------------|--------------|------------------|--------|---------------|--------|----------------|--------|----------------|--------|---------------------|--------|-------------------|--------|------------------|--------|----------------------|--------|
| I hereby claim benefit under Title 35, United States Code §120 of any United States application(s), or 365(C) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application or PCT international application in the manner provided in the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.  |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| U.S. Parent Application Number  | PCT Parent Number   | Parent Filing Date (MM/DD/YY) | Parent Patent Number (if applicable)                |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| 08/684,785  |                     | 07/22/96                      | 5,725,873   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| <input type="checkbox"/> Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto   |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and all continuation and divisional applications based thereon, and to transact all business in the Patent and Trademark Office connected therewith:  |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| <input type="checkbox"/> Firm Name _____ Customer/ or label Number _____<br>OR<br><input checked="" type="checkbox"/> List attorney(s) and/or agent(s) name and registration number below   |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <thead> <tr> <th style="width: 40%;">Name</th> <th style="width: 10%;">Registration Number</th> <th style="width: 40%;">Name</th> <th style="width: 10%;">Registration Number</th> </tr> </thead> <tbody> <tr><td>Thad F. Kryshak</td><td>19,428</td><td>Gregory A. Nelson</td><td>30,577</td></tr> <tr><td>Neil Hamilton</td><td>19,869</td><td>Keith M. Baxter</td><td>31,233</td></tr> <tr><td>Thomas W. Ehrmann</td><td>20,374</td><td>John D. Franzini</td><td>31,356</td></tr> <tr><td>Barry E. Sammons</td><td>25,608</td><td>Joseph W. Bain</td><td>34,290</td></tr> <tr><td>J. Rodman Steele</td><td>25,931</td><td>Robert J. Sacco</td><td>35,667</td></tr> <tr><td>Nicholas J. Seay</td><td>27,386</td><td>Jean C. Baker</td><td>35,433</td></tr> <tr><td>George E. Haas</td><td>27,642</td><td>David G. Ryser</td><td>35,407</td></tr> <tr><td>Michael J. McGovern</td><td>28,326</td><td>Bennett J. Berson</td><td>37,094</td></tr> <tr><td>Carl R. Schwartz</td><td>29,437</td><td>Michael A. Jaskolski</td><td>37,551</td></tr> </tbody> </table> |                     |                               |   |         | Name                            | Registration Number | Name  | Registration Number                                 | Thad F. Kryshak | 19,428              | Gregory A. Nelson | 30,577 | Neil Hamilton | 19,869 | Keith M. Baxter | 31,233       | Thomas W. Ehrmann | 20,374 | John D. Franzini | 31,356 | Barry E. Sammons | 25,608 | Joseph W. Bain | 34,290 | J. Rodman Steele | 25,931 | Robert J. Sacco | 35,667       | Nicholas J. Seay | 27,386 | Jean C. Baker | 35,433 | George E. Haas | 27,642 | David G. Ryser | 35,407 | Michael J. McGovern | 28,326 | Bennett J. Berson | 37,094 | Carl R. Schwartz | 29,437 | Michael A. Jaskolski | 37,551 |
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| Barry E. Sammons  | 25,608              | Joseph W. Bain                | 34,290  |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| J. Rodman Steele  | 25,931              | Robert J. Sacco               | 35,667  |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
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| <input type="checkbox"/> Additional attorney(s) and/or agents named on a supplemental priority sheet attached hereto  |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Please direct all correspondence to <input type="checkbox"/> Customer/ or label Number _____ OR <input checked="" type="checkbox"/> Fill in correspondence address below  |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <tr> <td style="width: 15%;">Name</td> <td colspan="4">Bennett J. Berson</td> </tr> <tr> <td>Address</td> <td colspan="4">Quarles &amp; Brady</td> </tr> <tr> <td>Address</td> <td colspan="4">P O Box 2113</td> </tr> <tr> <td>City</td> <td>Madison</td> <td>State</td> <td>WI</td> <td>Zip</td> </tr> <tr> <td>Country</td> <td>US</td> <td>Telephone</td> <td>608/251-5000</td> <td>Fax</td> </tr> <tr> <td></td> <td></td> <td></td> <td>608/251-9166</td> <td></td> </tr> </table>   |                     |                               |   |         | Name                            | Bennett J. Berson   |       |   |                 | Address             | Quarles & Brady   |        |               |        | Address         | P O Box 2113 |                   |        |                  | City   | Madison          | State  | WI             | Zip    | Country          | US     | Telephone       | 608/251-5000 | Fax              |        |               |        | 608/251-9166   |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Name  | Bennett J. Berson   |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Address   | Quarles & Brady     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Address   | P O Box 2113        |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| City  | Madison             | State                         | WI  | Zip     |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Country   | US                  | Telephone                     | 608/251-5000  | Fax     |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
|   |                     |                               | 608/251-9166  |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.  |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <tr> <td colspan="3">Name of Sole or First Inventor:</td> <td colspan="2">A petition has been filed for this unnamed inventor</td> </tr> <tr> <td>Given Name</td> <td>Middle</td> <td>Family</td> <td colspan="2">Suffix, Jr.</td> </tr> <tr> <td>Mark</td> <td>E.</td> <td>Cook</td> <td colspan="2"></td> </tr> </table>   |                     |                               |   |         | Name of Sole or First Inventor: |                     |       | A petition has been filed for this unnamed inventor |                 | Given Name          | Middle            | Family | Suffix, Jr.   |        | Mark            | E.           | Cook              |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
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| Given Name  | Middle              | Family                        | Suffix, Jr.   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Mark  | E.                  | Cook                          |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <tr> <td style="width: 15%;">Inventor's Signature</td> <td style="width: 55%;"><i>Mark E. Cook</i></td> <td style="width: 10%;">Date</td> <td colspan="2">4/30/98</td> </tr> </table>  |                     |                               |   |         | Inventor's Signature            | <i>Mark E. Cook</i> | Date  | 4/30/98   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Inventor's Signature  | <i>Mark E. Cook</i> | Date                          | 4/30/98   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
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| Residence: City   | Madison             | State                         | WI  | Country | US                              | Citizenship         | US    |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
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| Post Office Address   | 15 Kewaunee Court   |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| Post Office Address   |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
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| City  | Madison             | State                         | WI  | Zip     | 53705                           | Country             | US    | AGENCY  |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |
| <input checked="" type="checkbox"/> Additional inventors are being named on supplemental sheet(s) attached hereto   |                     |                               |   |         |                                 |                     |       |   |                 |                     |                   |        |               |        |                 |              |                   |        |                  |        |                  |        |                |        |                  |        |                 |              |                  |        |               |        |                |        |                |        |                     |        |                   |        |                  |        |                      |        |

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| DECLARATION   |  |       |  |  |  |        |  |    |  | ADDITIONAL INVENTOR(S)<br>Supplemental Sheet         |  |        |  |         |  |                     |  |    |  |        |  |
|---|--|-------|--|--|--|--------|--|----|--|--|--|--------|--|---------|--|---------------------|--|----|--|--------|--|
| Name of Additional Joint Inventor, if any:                                    |  |       |  |  |  |        |  |    |  | A petition has been filed for this unsigned inventor |  |        |  |         |  |                     |  |    |  |        |  |
| Given Name  |  | Daria |  |  |  | Middle |  | L. |  | Family   |  | Jerome |  |         |  | Suffix<br>e.g., Jr. |  |    |  |        |  |
| Inventor's Signature  |  |       |  |  |  |        |  |    |  | Date   |  |        |  |         |  |                     |  |    |  |        |  |
| Residence: City   |  |       |  |  |  | State  |  |    |  | Country  |  | US     |  |         |  | Citizenship         |  | US |  |        |  |
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| City  |  |       |  |  |  | State  |  |    |  | Zip  |  |        |  | Country |  | US                  |  |    |  | ABBRVY |  |
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| Given Name  |  |       |  |  |  | Middle |  |    |  | Family   |  |        |  |         |  | Suffix<br>e.g., Jr. |  |    |  |        |  |
| Inventor's Signature  |  |       |  |  |  |        |  |    |  | Date   |  |        |  |         |  |                     |  |    |  |        |  |
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| Given Name  |  |       |  |  |  | Middle |  |    |  | Family   |  |        |  |         |  | Suffix<br>e.g., Jr. |  |    |  |        |  |
| Inventor's Signature  |  |       |  |  |  |        |  |    |  | Date   |  |        |  |         |  |                     |  |    |  |        |  |
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Approved for use through 9/30/98. OMB 0651-0032  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

|  |                          |              |
|--|--------------------------|--------------|
| <b>DECLARATION FOR<br/>UTILITY OR DESIGN<br/>PATENT APPLICATION</b><br><br><input type="checkbox"/> Declaration Submitted with Initial Filing    OR <input checked="" type="checkbox"/> Declaration Submitted after Initial Filing | Attorney Docket Number   | 960296.94011 |
|  | First Named Inventor     | Mark E. Cook |
|  | <b>COMPLETE IF KNOWN</b> |              |
|  | Application Number       | 09/037,690   |
|  | Filing Date              | 03/10/98     |
|  | Group Art Unit           |              |
| Examiner Name  |                          |              |

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method of Improving the Growth or the Efficiency of Feed Conversion of an Animal and Compositions for Use Therein

the specification of which

(Title of the invention)

☐ is attached hereto

OR

☒ was filed on (MM/DD/YY)

03/10/98

as United States Application Number or PCT International

Application Number

09/037,690

and was amended on (MM/DD/YY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

| Prior Foreign Application Number(s) | Country | Foreign Filing Date (MM/DD/YY) | Priority Not Claimed     | Certified Copy Attached? |
|-------------------------------------|---------|--------------------------------|--------------------------|--------------------------|
|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |
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|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |
|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |
|                                     |         |                                | <input type="checkbox"/> | <input type="checkbox"/> |

☐ Additional foreign applications numbers are listed on a supplemental priority sheet attached hereto:

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

| Application Number(s) | Filing Date (MM/DD/YY) |
|-----------------------|------------------------|
|                       |                        |
|                       |                        |

☐ Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.

Burden Hour Statement: This form is estimated to take .4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231. DO QBMAD156294

Please type a plus sign (+) inside this box +

| DECLARATION  |                     |   |                                      | Page 2                  |      |
|--|---------------------|---|--------------------------------------|-------------------------|------|
| <p>I hereby claim benefit under Title 35, United States Code §112 of any United States application(s), or §365(C) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application or PCT international application in the manner provided in the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.</p> |                     |   |                                      |                         |      |
| U.S. Parent Application Number   | PCT Parent Number   | Parent Filing Date (MM/DD/YY)   | Parent Patent Number (if applicable) |                         |      |
| 08/684,785   |                     | 07/22/96  | 5,725,873                            |                         |      |
| <input type="checkbox"/> Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto  |                     |   |                                      |                         |      |
| <p>As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and all continuation and divisional applications based thereon, and to transact all business in the Patent and Trademark Office connected therewith:</p>  |                     |   |                                      |                         |      |
| <input type="checkbox"/> Firm Name <span style="border: 1px solid black; display: inline-block; width: 200px; height: 1em; vertical-align: middle;"></span> Customer Number <span style="border: 1px solid black; display: inline-block; width: 100px; height: 1em; vertical-align: middle;"></span> or label <span style="border: 1px solid black; display: inline-block; width: 100px; height: 1em; vertical-align: middle;"></span><br>OR<br><input checked="" type="checkbox"/> List attorney(s) and/or agent(s) name and registration number below  |                     |   |                                      |                         |      |
| Name   | Registration Number | Name  | Registration Number                  |                         |      |
| Thad F. Kryshak  | 19,428              | Gregory A. Nelson   | 30,577                               |                         |      |
| Neil Hamilton  | 19,869              | Keith M. Baxter   | 31,233                               |                         |      |
| Thomas W. Ehrmann  | 20,374              | John D. Franzini  | 31,356                               |                         |      |
| Barry E. Sammons   | 25,608              | Joseph W. Bain  | 34,290                               |                         |      |
| J. Rodman Steele   | 25,931              | Robert J. Sacco   | 35,667                               |                         |      |
| Nicholas J. Seay   | 27,386              | Jean C. Baker   | 35,433                               |                         |      |
| George E. Haas   | 27,642              | David G. Ryser  | 35,407                               |                         |      |
| Michael J. McGovern  | 28,326              | Bennett J. Berson   | 37,094                               |                         |      |
| Carl R. Schwartz   | 29,437              | Michael A. Jaskolski  | 37,551                               |                         |      |
| <input type="checkbox"/> Additional attorney(s) and/or agents named on a supplemental priority sheet attached hereto   |                     |   |                                      |                         |      |
| <p>Please direct all correspondence to <input type="checkbox"/> Customer Number <span style="border: 1px solid black; display: inline-block; width: 150px; height: 1em; vertical-align: middle;"></span> OR <input checked="" type="checkbox"/> Fill in correspondence address below</p>   |                     |   |                                      |                         |      |
| Name <b>Bennett J. Berson</b>  |                     |   |                                      |                         |      |
| Address <b>Quarles &amp; Brady</b>   |                     |   |                                      |                         |      |
| Address <b>P O Box 2113</b>  |                     |   |                                      |                         |      |
| City <b>Madison</b>  |                     | State <b>WI</b>   |                                      | Zip <b>53701-2113</b>   |      |
| Country <b>US</b>  |                     | Telephone <b>608/251-5000</b>   |                                      | Fax <b>608/251-9166</b> |      |
| <p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.</p>  |                     |   |                                      |                         |      |
| <p>Name of Sole or First Inventor: <span style="border: 1px solid black; display: inline-block; width: 150px; height: 1em; vertical-align: middle;"></span> A petition has been filed for this unsigned inventor</p>   |                     |   |                                      |                         |      |
| First Name   | Mark                | Middle  | E.                                   | Family Name             | Cook |
| Inventor's Signature   |                     |   |                                      |                         | Date |
| <p>Residence: City <b>Madison</b> State <b>WI</b> Country <b>US</b> Citizenship <b>US</b></p>  |                     |   |                                      |                         |      |
| <p>Post Office Address <b>15 Kewaunee Court</b></p>  |                     |   |                                      |                         |      |
| <p>Post Office Address <span style="border: 1px solid black; display: inline-block; width: 150px; height: 1em; vertical-align: middle;"></span></p>  |                     |   |                                      |                         |      |
| City <b>Madison</b>  |                     | State <b>WI</b>   |                                      | Zip <b>53705</b>        |      |
| Country <b>US</b>  |                     | Applicant <span style="border: 1px solid black; display: inline-block; width: 50px; height: 1em; vertical-align: middle;"></span> |                                      |                         |      |
| <input type="checkbox"/> Additional inventors are being named on supplemental sheet(s) attached hereto   |                     |   |                                      |                         |      |

Please type a plus sign (+) inside this box ☐

| DECLARATION   |  |                        |  |  |  |        |  |    |  | ADDITIONAL INVENTOR(S)<br>Supplemental Sheet         |  |        |  |         |  |                     |  |    |  |  |  |
|---|--|------------------------|--|--|--|--------|--|----|--|--|--|--------|--|---------|--|---------------------|--|----|--|--|--|
| Name of Additional Joint Inventor, if any:                                    |  |                        |  |  |  |        |  |    |  | A petition has been filed for this unsigned inventor |  |        |  |         |  |                     |  |    |  |  |  |
| Name  |  | Daria                  |  |  |  | Middle |  | L. |  | Family   |  | Jerome |  |         |  | Suffix<br>e.g., Jr. |  |    |  |  |  |
| Inventor's<br>Signature   |  | <i>Daria L. Jerome</i> |  |  |  |        |  |    |  |  |  | Date   |  | 4-21-98 |  |                     |  |    |  |  |  |
| Residence: City   |  | Frazee                 |  |  |  | State  |  | MN |  | Country  |  | US     |  |         |  | Citizenship         |  | US |  |  |  |
| Post Office Address   |  | P.O. Box 1462 4-21-98  |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| Post Office Address   |  | 4-21-98                |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| City  |  | Detroit Lakes          |  |  |  | State  |  | MN |  | Zip  |  | 56502  |  |         |  | Country             |  | US |  |  |  |
|   |  | ADDITIONAL             |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| Name of Additional Joint Inventor, if any:                                    |  |                        |  |  |  |        |  |    |  | A petition has been filed for this unsigned inventor |  |        |  |         |  |                     |  |    |  |  |  |
| Name  |  |                        |  |  |  | Middle |  |    |  | Family   |  |        |  |         |  | Suffix<br>e.g., Jr. |  |    |  |  |  |
| Inventor's<br>Signature   |  |                        |  |  |  |        |  |    |  |  |  | Date   |  |         |  |                     |  |    |  |  |  |
| Residence: City   |  |                        |  |  |  | State  |  |    |  | Country  |  |        |  |         |  | Citizenship         |  |    |  |  |  |
| Post Office Address   |  |                        |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| Post Office Address   |  |                        |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| City  |  |                        |  |  |  | State  |  |    |  | Zip  |  |        |  |         |  | Country             |  |    |  |  |  |
|   |  | ADDITIONAL             |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| Name of Additional Joint Inventor, if any:                                    |  |                        |  |  |  |        |  |    |  | A petition has been filed for this unsigned inventor |  |        |  |         |  |                     |  |    |  |  |  |
| Name  |  |                        |  |  |  | Middle |  |    |  | Family   |  |        |  |         |  | Suffix<br>e.g., Jr. |  |    |  |  |  |
| Inventor's<br>Signature   |  |                        |  |  |  |        |  |    |  |  |  | Date   |  |         |  |                     |  |    |  |  |  |
| Residence: City   |  |                        |  |  |  | State  |  |    |  | Country  |  |        |  |         |  | Citizenship         |  |    |  |  |  |
| Post Office Address   |  |                        |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| Post Office Address   |  |                        |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| City  |  |                        |  |  |  | State  |  |    |  | Zip  |  |        |  |         |  | Country             |  |    |  |  |  |
|   |  | ADDITIONAL             |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |
| Additional inventors are being named on supplemental sheet(s) attached hereto |  |                        |  |  |  |        |  |    |  |  |  |        |  |         |  |                     |  |    |  |  |  |

## FEE TRANSMITTAL

JUN - 1 1998

Patent fees are subject to annual revision on October 1.  
These are the fees effective October 1, 1997.  
Small Entity payments must be supported by a small entity statement  
otherwise large entity fees must be paid. See Forms PTO/SB/08-12

TOTAL AMOUNT OF PAYMENT \$ 130.00

## Complete if Known

|                        |                                 |
|------------------------|---------------------------------|
| Application Number     | 09/037,690                      |
| Filing Date            | 03/10/98                        |
| First Named Inventor   | Mark E. Cook                    |
| Group Art Unit         | 1615                            |
| Examiner Name          |                                 |
| Attorney Docket Number | 960296.94011 (now 960296.95297) |

## METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 17-0055

Deposit Account Name: Quarles & Brady

☒ Charge Any Additional Fee Required Under 37 CFR 1.18 and 1.17 ☐ Charge the Issue Fee Set in 37 CFR 1.18 at the Mailing of the Notice of Allowance, 37 CFR 1.311(b)

2. ☐ Payment Enclosed:

☐ Check ☐ Money Order ☐ Other

## FEE CALCULATION (fees effective 10/01/97)

## 1. FILING FEE

| Large Entity Fee Code | Large Entity Fee (\$) | Small Entity Fee Code | Small Entity Fee (\$) | Fee Description        | Fee Paid |
|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|----------|
| 101                   | 790                   | 201                   | 395                   | Utility filing fee     |          |
| 106                   | 330                   | 206                   | 165                   | Design filing fee      |          |
| 107                   | 540                   | 207                   | 270                   | Plant filing fee       |          |
| 108                   | 790                   | 208                   | 395                   | Reissue filing fee     |          |
| 114                   | 150                   | 214                   | 75                    | Provisional filing fee |          |

SUBTOTAL (1) (\$)

## 2. CLAIMS

|  | Extra                      | Fee from below         | Fee Paid               |
|--|----------------------------|------------------------|------------------------|
| Total Claims <input type="text"/>              | -20** <input type="text"/> | X <input type="text"/> | = <input type="text"/> |
| Independent Claims <input type="text"/>        | -3** <input type="text"/>  | X <input type="text"/> | = <input type="text"/> |
| Multiple Dependent Claims <input type="text"/> |                            | <input type="text"/>   | = <input type="text"/> |

\*\* or number previously paid, if greater. For reissues see below

| Large Entity Fee Code | Large Entity Fee (\$) | Small Entity Fee Code | Small Entity Fee (\$) | Fee Description   |
|-----------------------|-----------------------|-----------------------|-----------------------|---|
| 103                   | 22                    | 203                   | 11                    | Claims in excess of 20                                    |
| 102                   | 82                    | 202                   | 41                    | Independent claims in excess of 3                         |
| 104                   | 270                   | 204                   | 135                   | Multiple dependent claim                                  |
| 109                   | 80                    | 209                   | 40                    | **Reissue independent claims over original patent         |
| 110                   | 22                    | 210                   | 11                    | **Reissue claims in excess of 20 and over original patent |

SUBTOTAL (2) (\$)

## FEE CALCULATION (continued)

## 3. ADDITIONAL FEES

| Large Entity Fee Code | Large Entity Fee (\$) | Small Entity Fee Code | Small Entity Fee (\$) | Fee  |        |
|-----------------------|-----------------------|-----------------------|-----------------------|--|--------|
| 105                   | 130                   | 205                   | 65                    | Surcharge - late filing fee or oth   | 130.00 |
| 127                   | 50                    | 227                   | 25                    | Surcharge - late provisional filing fee or cover sheet                     |        |
| 139                   | 130                   | 139                   | 130                   | Non-English specification  |        |
| 147                   | 2,520                 | 147                   | 2,520                 | For filing a request for reexamination                                     |        |
| 112                   | 920                   | 112                   | 920                   | Requesting publication of SIR prior to Examiner action                     |        |
| 113                   | 1,840                 | 113                   | 1,840                 | Requesting publication of SIR after Examiner action                        |        |
| 115                   | 110                   | 215                   | 55                    | Extension for reply within first month                                     |        |
| 116                   | 400                   | 216                   | 200                   | Extension for reply within second month                                    |        |
| 117                   | 950                   | 217                   | 475                   | Extension for reply within third month                                     |        |
| 118                   | 1,510                 | 218                   | 755                   | Extension for reply within fourth month                                    |        |
| 128                   | 2,060                 | 228                   | 1,030                 | Extension for reply within fifth month                                     |        |
| 119                   | 310                   | 219                   | 155                   | Notice of Appeal   |        |
| 120                   | 310                   | 220                   | 155                   | Filing a brief in support of an appeal                                     |        |
| 121                   | 270                   | 221                   | 135                   | Request for oral hearing   |        |
| 138                   | 1,510                 | 138                   | 1,510                 | Petition to institute a public use proceeding                              |        |
| 140                   | 110                   | 240                   | 55                    | Petition to revive unavoidably abandoned application                       |        |
| 141                   | 1,320                 | 241                   | 660                   | Petition to revive unintentionally abandoned application                   |        |
| 142                   | 1,320                 | 242                   | 660                   | Utility issue fee (or reissue)   |        |
| 143                   | 450                   | 243                   | 225                   | Design issue fee   |        |
| 144                   | 670                   | 244                   | 335                   | Plant issue fee  |        |
| 122                   | 130                   | 122                   | 130                   | Petitions to the Commissioner  |        |
| 123                   | 50                    | 123                   | 50                    | Petitions related to provisional applications                              |        |
| 126                   | 240                   | 126                   | 240                   | Submission of Information Disclosure Stmt                                  |        |
| 581                   | 40                    | 581                   | 40                    | Recording each patent assignment per property (times number of properties) |        |
| 146                   | 790                   | 246                   | 395                   | Filing a submission after final rejection (37 CFR 1.129(a))                |        |
| 149                   | 790                   | 249                   | 395                   | For each additional invention to be examined (37 CFR 1.129(b))             |        |

Other fee (specify) \_\_\_\_\_

Other fee (specify) \_\_\_\_\_

SUBTOTAL (3) (\$130.00)

\* Reduced by Basic Filing Fee Paid

## SUBMITTED BY

Typed or Printed Name: Bennett J. Berson

Signature: 

Date

May 27 1998

## Complete (if applicable)

Reg. Number: 37,094

Deposit Account User ID

QBMA0161991 (now 960296.95297)





UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
ASSISTANT SECRETARY OF COMMERCE AND  
COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

**NOTICE OF FILING/CLAIM FEE(S) DUE**  
TO ENSURE PROPER CREDIT OF FEES, PLEASE RETURN A COPY OF THIS  
FEE CALCULATION SHEET WITH YOUR RESPONSE.

APPLICATION NUMBER: 09/037690

**Total Fee Calculation**

| Fee Code                     | Total<br># Claims | Number<br>Extra                   | X | Fee        | Fee =                               | Total         |
|------------------------------|-------------------|-----------------------------------|---|------------|-------------------------------------|---------------|
| Sm./Lg.                      |                   |                                   |   | Sm. Entity | Lg. Entity                          |               |
| Basic Filing Fee             | <u>201/101</u>    |                                   |   |            | <input checked="" type="checkbox"/> |               |
| Total Claims >20             | <u>203/103</u>    | <u>      </u> -20 = <u>      </u> | X |            |                                     |               |
| Independent Claims >3        | <u>202/102</u>    | <u>      </u> -3 = <u>      </u>  | X |            |                                     |               |
| Mult. Dep Claim Present      | <u>204/104</u>    |                                   |   |            |                                     |               |
| Surcharge                    | <u>205/105</u>    |                                   |   |            |                                     |               |
| English Translation          | <u>139</u>        |                                   |   |            |                                     | <u>130.00</u> |
| <b>TOTAL FEE CALCULATION</b> |                   |                                   |   |            |                                     |               |

Fees due upon filing the application:

Total Filing Fees Due = \$                     

Less Filing Fees Submitted - \$                     

BALANCE DUE = \$ 130.00

Melinda O  
Office of Initial Patent Examination

*Unsigned Declaration*



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

| APPLICATION NUMBER | FILING/RECEIPT DATE | FIRST NAMED APPLICANT | ATTORNEY DOCKET NO./TITLE |
|--------------------|---------------------|-----------------------|---------------------------|
| 09/037,690         | 03/10/98            | COOK                  | M. 960296.94011           |

BENNETT J. BERSON  
QUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

0232/0327

NOT ASSIGNED

1615

DATE MAILED:

03/27/98

**NOTICE TO FILE MISSING PARTS OF APPLICATION**  
**Filing Date Granted**

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). If any of items 1 or 3 through 8 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of \$65.00 for a small entity in compliance with 37 CFR 1.27, or \$130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.

If all required items on this form are filed within the period set above, the total amount owed by applicant as a ☐ small entity (statement filed) ☐ non-small entity is \$ 1615

☐ 1. The statutory basic filing fee is:

- ☐ missing.
- ☐ insufficient.

Applicant must submit \$ \_\_\_\_\_ to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

☐ 2. Additional claim fees of \$ \_\_\_\_\_ including any multiple dependent claim fees, are required.

\$ \_\_\_\_\_ for \_\_\_\_\_ independent claims over 3.

\$ \_\_\_\_\_ for \_\_\_\_\_ dependent claims over 20.

\$ \_\_\_\_\_ for multiple dependent claim surcharge.

Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

☐ 3. The oath or declaration:

- ☐ is missing or unexecuted.
- ☐ does not cover the newly submitted items.
- ☐ does not identify the application to which it applies.
- ☐ does not include the city and state or foreign country of applicant's residence.

An oath or declaration in compliance with 37 CFR 1.63, including residence information and identifying the application by the above Application Number and Filing Date, is required.

☒ 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

☐ 6. A \$50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application does not comply with the Sequence Rules.  
See attached "Notice to Comply with Sequence Rules 37 CFR 1.821-1.825"

☐ 9. OTHER:

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

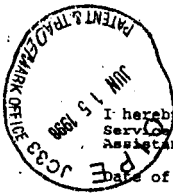
**A copy of this notice MUST be returned with the reply.**

Customer Service Center  
Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE

FORM PTO-1583 (REV. 8-97)

06/03/1998 WILLIAM 0000032 170655 0993390  
01 FC:105 130 00 21



I hereby certify that this correspondence is being deposited with the United States Postal Service on the date set forth below as First Class Mail in an envelope addressed to:  
Assistant Commissioner for Patents, Washington, D.C. 20331.

Date of Signature and Deposit: June 9, 1998

*[Signature]*  
Bennett J. Berson

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark E. Cook et al.

Date: June 9, 1998

Serial No.: 09/037,690

Group Art Unit: 1644

Filed: March 10, 1998

Examiner: F. VanderVegt

File No.: 960296.95297 (formerly 960296.94011)

For: METHOD OF IMPROVING THE GROWTH OR THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN.

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner For Patents  
Box Non-Fee  
Washington DC 20231

Dear Sir:

Enclosed is a completed form PTO-1449 listing documents which the applicants in the above-identified application wish to bring to the attention of the Examiner for consideration in connection with the examination on the merits of this application.

This application is a continuation-in-part of U.S. Application Serial No. 08/684,785, filed July 22, 1996, now U.S. Patent No. 5,725,873. The documents listed on the Form 1449 were previously cited by or submitted to the Office in U.S. Application No. 08/684,785. Pursuant to 1.98(d), copies of documents that were earlier cited by or submitted to the Office in a prior application are not included herein.

The Applicants note that in an Office Action mailed June 4, 1998, the Examiner cited Cook et al. (U.S. Patent No. 5,428,072), Tokoro (U.S. Patent No. 5,080,895), Ludington et al. (U.S. Patent No. 3,119,691), and Albright et al., Drug Dev. Ind. Pharm. 20(12):2035-2039 (1994), all of record in U.S. Patent No. 5,725,873, which was also cited by the

GP 1644

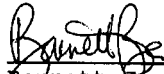
#5  
S. J. C.  
10/29/98

RECEIVED  
JUN 22 1998  
JUN 22 1998

Examiner. These citations are not repeated on the attached PTO-1449.

No additional fee is believed due in connection with the submission of this Information Disclosure Statement, because it is being submitted within three months of the filing date. However, should any fee be due, please charge the fee to Deposit Account No. 17-0055.

Respectfully submitted,



Bennett J. Berson  
Reg. No. 37,094  
Attorney for Applicant  
QUARLES & BRADY  
P.O. Box 2113  
Madison, WI 53701-2113  
(608) 251-5000

QBMAD\160499



## FEE TRANSMITTAL

Complete if Known

Patent fees are subject to annual revision on October 1.  
These are the fees effective October 1, 1997.  
Small Entity payments must be supported by a small entity statement,  
otherwise large entity fees must be paid. See Forms PTO/SB/09-12

TOTAL AMOUNT OF

\$

Application Number

09/037,690

Filing Date

3/10/98

First Named Inventor

Mark E. Cook

Group Art Unit

1644

Examiner Name

F. Pierre VanderVegt

Attorney Docket

960296.95297

## METHOD OF PAYMENT (check one)

- 1.
- ☒
- The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit  
Account  
Number

17-0055

Deposit  
Account  
Name

Quarles &amp; Brady

- ☒
- Charge Any Additional
- 
- Fees Required Under 37
- 
- CFR 1.16 and 1.17
- ☐
- Charge the Issue Fee Set in 37 CFR
- 
- 1.18 at the mailing of the Notice of
- 
- Allowance, 37 CFR 1.311(b)

- 2.
- ☐
- Payment Enclosed:

☐ Check☐ Money  
Order☐ Other

## FEE CALCULATION (fees effective 10/01/97)

## 1. FILING FEE

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee Description        | Fee Paid |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------|----------|
| 101                         | 790                         | 201                         | 395                         | Utility filing fee     |          |
| 106                         | 330                         | 206                         | 165                         | Design filing fee      |          |
| 107                         | 540                         | 207                         | 270                         | Plant filing fee       |          |
| 108                         | 790                         | 208                         | 395                         | Reissue filing fee     |          |
| 114                         | 150                         | 214                         | 75                          | Provisional filing fee |          |

SUBTOTAL (1) (\$)

0

## 2. CLAIMS

| Total Claims              | Extra | Fee from<br>below | Fee Paid |
|---------------------------|-------|-------------------|----------|
|                           | -20** | X                 |          |
| Independent<br>Claims     | -3**  | X                 |          |
| Multiple Dependent Claims |       |                   |          |

\*\* or number previously paid, if greater. For reissues see below

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee Description  |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|
| 103                         | 22                          | 203                         | 11                          | Claims in excess of 20                                       |
| 102                         | 82                          | 202                         | 41                          | Independent claims in excess of 3                            |
| 104                         | 270                         | 204                         | 135                         | Multiple dependent claim                                     |
| 109                         | 80                          | 209                         | 40                          | **Reissue independent claims<br>over original patent         |
| 110                         | 22                          | 210                         | 11                          | **Reissue claims in excess of 20<br>and over original patent |

SUBTOTAL (2) (\$)

0

## FEE CALCULATION (continued)

## 3. ADDITIONAL FEES

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee   |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---|
| 105                         | 130                         | 205                         | 85                          | Surcharge - late filing fee or oath   |
| 127                         | 50                          | 227                         | 25                          | Surcharge - late provisional filing fee or<br>cover sheet                     |
| 139                         | 130                         | 139                         | 130                         | Non-English specification   |
| 147                         | 2,520                       | 147                         | 2,520                       | For filing a request for reexamination  |
| 112                         | 920                         | 112                         | 920                         | Requesting publication of SIR prior to<br>Examiner action                     |
| 113                         | 1,840                       | 113                         | 1,840                       | Requesting publication of SIR after Examiner<br>action                        |
| 115                         | 110                         | 215                         | 55                          | Extension for reply within first month  |
| 116                         | 400                         | 216                         | 200                         | Extension for reply within second month                                       |
| 117                         | 950                         | 217                         | 475                         | Extension for reply within third month  |
| 118                         | 1,510                       | 218                         | 755                         | Extension for reply within fourth month                                       |
| 128                         | 2,080                       | 228                         | 1,030                       | Extension for reply within fifth month  |
| 119                         | 310                         | 219                         | 155                         | Notice of Appeal  |
| 120                         | 310                         | 220                         | 155                         | Filing a brief in support of an appeal  |
| 121                         | 270                         | 221                         | 135                         | Request for oral hearing  |
| 138                         | 1,510                       | 138                         | 1,510                       | Petition to institute a public use proceeding                                 |
| 140                         | 110                         | 240                         | 55                          | Petition to revive unavoidably abandoned<br>application                       |
| 141                         | 1,320                       | 241                         | 660                         | Petition to revive unintentionally abandoned<br>application                   |
| 142                         | 1,320                       | 242                         | 660                         | Utility issue fee (or reissue)  |
| 143                         | 460                         | 243                         | 225                         | Design issue fee  |
| 144                         | 670                         | 244                         | 335                         | Plant issue fee   |
| 122                         | 130                         | 122                         | 130                         | Petitions to the Commissioner   |
| 123                         | 50                          | 123                         | 50                          | Petitions related to provisional applications                                 |
| 126                         | 240                         | 126                         | 240                         | Submission of Information Disclosure Stmt                                     |
| 581                         | 40                          | 581                         | 40                          | Recording each patent assignment per<br>property (times number of properties) |
| 145                         | 790                         | 245                         | 395                         | Filing a submission after final rejection<br>(37 CFR 1.129(a))                |
| 149                         | 790                         | 249                         | 395                         | For each additional invention to be examined<br>(37 CFR 1.129(b))             |

Other fee (specify) Information Disclosure Statement

0

Other fee (specify)

SUBTOTAL (3) (\$)

0

\* Reduced by Basic Filing Fee Paid

## SUBMITTED BY

Typed or  
Printed Name

Bennett J. Berson

Signature

Date

June 9, 1998

## Complete (if applicable)

Reg. Number

37, 094

Deposit Account  
User ID

QBMA0163114

GAU 1644 #

PATENT

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date set forth below as First Class  
Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

Date of Signature and Deposit October 5, 1998

Bennett J. Berson  
Bennett J. Berson, Reg. No. 37,094

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Cook/Jerome

Serial No.: 09/037,690

Filed: 03/10/98

For: METHOD OF IMPROVING THE  
GROWTH OR THE EFFICIENCY  
OF FEED CONVERSION OF AN  
ANIMAL AND COMPOSITIONS  
FOR USE THEREIN



Date: October 5, 1998

Examiner: F. Vandervegt

Art Unit: 1644

File No.: 960296.94011  
(now 960296.95297)

#6  
H.8.  
10/29/98

PETITION AND FEE FOR EXTENSION OF TIME  
(37 CFR 1.136(a))

Assistant Commissioner For Patents  
Washington, D.C. 20231

Sir:

Applicant hereby petitions the Commissioner of Patents and  
Trademarks to extend the time for response to the Office Action dated  
06/04/98 for one(1) month(s) from 09/04/98 to 10/04/98.

Applicant is

- ☐ a small entity, a verified statement for which:  
☐ is attached.  
☐ was filed previously.  
☒ other than a small entity.

| Extension:                          | Months       | Fee for Non-<br>Small Entity | Fee for<br>Small Entity |
|-------------------------------------|--------------|------------------------------|-------------------------|
| <input checked="" type="checkbox"/> | one month    | \$110.00                     | \$55.00                 |
| <input type="checkbox"/>            | two months   | \$400.00                     | \$200.00                |
| <input type="checkbox"/>            | three months | \$950.00                     | \$475.00                |
| <input type="checkbox"/>            | four months  | \$1510.00                    | \$755.00                |
| <input type="checkbox"/>            | five months  | \$2060.00                    | \$1030.00               |

Fee \$110.00

Please charge the above-identified fee and any additional fee due in  
this application to Deposit Account No. 17-0055.

A response to the Office Action

- ☒ is filed herewith.  
☐ has been filed.

Respectfully submitted,

10/13/1998 AIRBORNE 00000146 170055 09037690

01 FC:115 110.00 CH

Quarles and Brady  
P O Box 2113  
Madison, WI 53701-2113  
(608)251-5000

QBMAD\171850


By:

Bennett J. Berson  
Bennett J. Berson  
Reg. No. 37,094

RECEIVED  
OCT 13 1998  
10:04

| FEE TRANSMITTAL  |          | Complete if Known    |                      |
|--|----------|----------------------|----------------------|
| <p>Patent fees are subject to annual revision on October 1.<br/>These are the fees effective October 1, 1998.<br/>Small Entity payments must be supported by a small entity statement<br/>otherwise large entity fees must be paid. See Forms PTO/SB/08-12</p> |          | Application Number   | 09/037,690           |
|  |          | Filing Date          | 3/10/98              |
|  |          | First Named Inventor | Mark E. Cook         |
|  |          | Group Art Unit       | 1644                 |
|  |          | Examiner Name        | F. Pierre VanderVegt |
| TOTAL AMOUNT OF  | \$192.00 | Attorney Docket      | 960296.95297         |

| METHOD OF PAYMENT (check one)   |                       | FEE CALCULATION (continued)   |                       |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
|---|-----------------------|---|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------|-----|-------------------------|------|--------------------|----|-------------------------------------|-----|-----|-----|-----------------------|-----------------------|--|-----------------------|-----------------|-----|------------------|-----|---------------------------|------------------------|-----|-------|--------------------|-------|--|-----|-----|-----|------------------------|--------------------------|--|----|-----|-------|---|-------|---|-----|-----|---|-------------------|----|--|--------|-----|-------|-----|-----|---|--|-----|-----|-----|-----|--|--|-----|-------|-----|-----|---|--|-----|-------|-----|-------|--|--|-----|-----|-----|-----|------------------|--|-----|-----|-----|-----|--|--|-----|-----|-----|-----|--------------------------|--|-----|-------|-----|-------|---|--|-----|-----|-----|----|--|--|-----|-------|-----|-----|--|--|-----|-------|-----|-----|--------------------------------|--|-----|-----|-----|-----|------------------|--|-----|-----|-----|-----|-----------------|--|-----|-----|-----|-----|-------------------------------|--|-----|----|-----|----|---|--|-----|-----|-----|-----|---|--|-----|----|-----|----|--|--|-----|-----|-----|-----|---|--|-----|-----|-----|-----|--|--|----------------------|--|--|--|--|----------------------|--|--|--|--|-------------------|--|--|--|--------|
| <p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:</p> <p>Deposit Account Number: 17-0055</p> <p>Deposit Account Name: Quarles &amp; Brady</p> <p><input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17 <input type="checkbox"/> Charge the Issue Fee Set in 37 CFR 1.18 at the Option of the Notice of Allowance, 37 CFR 1.31(d)</p>  |                       | <p>3. ADDITIONAL FEES</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Large Entity Fee (\$)</th><th>Small Entity Fee Code</th><th>Small Entity Fee (\$)</th><th>Fee Description</th><th>Fee</th></tr></thead><tbody><tr><td>105</td><td>130</td><td>205</td><td>65</td><td>Surcharge - late filing fee or oath</td><td></td></tr><tr><td>127</td><td>50</td><td>227</td><td>25</td><td>Surcharge - late provisional filing fee or cover sheet</td><td></td></tr><tr><td>139</td><td>130</td><td>139</td><td>130</td><td>Non-English specification</td><td></td></tr><tr><td>147</td><td>2,520</td><td>147</td><td>2,520</td><td>For filing a request for reexamination</td><td></td></tr><tr><td>112</td><td>920</td><td>112</td><td>920</td><td>Requesting publication of SIR prior to Examiner action</td><td></td></tr><tr><td>113</td><td>1,840</td><td>113</td><td>1,840</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr><tr><td>115</td><td>110</td><td>215</td><td>55</td><td>Extension for reply within first month</td><td>110.00</td></tr><tr><td>116</td><td>400</td><td>216</td><td>200</td><td>Extension for reply within second month</td><td></td></tr><tr><td>117</td><td>950</td><td>217</td><td>475</td><td>Extension for reply within third month</td><td></td></tr><tr><td>118</td><td>1,510</td><td>218</td><td>755</td><td>Extension for reply within fourth month</td><td></td></tr><tr><td>128</td><td>2,060</td><td>228</td><td>1,030</td><td>Extension for reply within fifth month</td><td></td></tr><tr><td>119</td><td>310</td><td>219</td><td>155</td><td>Notice of Appeal</td><td></td></tr><tr><td>120</td><td>310</td><td>220</td><td>155</td><td>Filing a brief in support of an appeal</td><td></td></tr><tr><td>121</td><td>270</td><td>221</td><td>135</td><td>Request for oral hearing</td><td></td></tr><tr><td>138</td><td>1,510</td><td>138</td><td>1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr><tr><td>140</td><td>110</td><td>240</td><td>55</td><td>Petition to revive unavoidably abandoned application</td><td></td></tr><tr><td>141</td><td>1,320</td><td>241</td><td>660</td><td>Petition to revive unintentionally abandoned application</td><td></td></tr><tr><td>142</td><td>1,320</td><td>242</td><td>660</td><td>Utility issue fee (or reissue)</td><td></td></tr><tr><td>143</td><td>450</td><td>243</td><td>225</td><td>Design issue fee</td><td></td></tr><tr><td>144</td><td>670</td><td>244</td><td>335</td><td>Plant issue fee</td><td></td></tr><tr><td>122</td><td>130</td><td>122</td><td>130</td><td>Petitions to the Commissioner</td><td></td></tr><tr><td>123</td><td>50</td><td>123</td><td>50</td><td>Petitions related to provisional applications</td><td></td></tr><tr><td>126</td><td>240</td><td>126</td><td>240</td><td>Submission of Information Disclosure Stmt</td><td></td></tr><tr><td>581</td><td>40</td><td>581</td><td>40</td><td>Recording each patent assignment per property (times number of properties)</td><td></td></tr><tr><td>146</td><td>790</td><td>246</td><td>395</td><td>Filing a submission after final rejection (37 CFR 1.129(a))</td><td></td></tr><tr><td>149</td><td>790</td><td>249</td><td>395</td><td>For each additional invention to be examined (37 CFR 1.129(b))</td><td></td></tr><tr><td colspan="4">Other fee (specify):</td><td></td></tr><tr><td colspan="4">Other fee (specify):</td><td></td></tr><tr><td colspan="4">SUBTOTAL (3) (\$)</td><td>110.00</td></tr></tbody></table> |                       | Large Entity Fee Code  | Large Entity Fee (\$) | Small Entity Fee Code | Small Entity Fee (\$) | Fee Description | Fee | 105                     | 130  | 205                | 65 | Surcharge - late filing fee or oath |     | 127 | 50  | 227                   | 25                    | Surcharge - late provisional filing fee or cover sheet |                       | 139             | 130 | 139              | 130 | Non-English specification |                        | 147 | 2,520 | 147                | 2,520 | For filing a request for reexamination |     | 112 | 920 | 112                    | 920                      | Requesting publication of SIR prior to Examiner action |    | 113 | 1,840 | 113   | 1,840 | Requesting publication of SIR after Examiner action |     | 115 | 110   | 215               | 55 | Extension for reply within first month | 110.00 | 116 | 400   | 216 | 200 | Extension for reply within second month |  | 117 | 950 | 217 | 475 | Extension for reply within third month |  | 118 | 1,510 | 218 | 755 | Extension for reply within fourth month |  | 128 | 2,060 | 228 | 1,030 | Extension for reply within fifth month |  | 119 | 310 | 219 | 155 | Notice of Appeal |  | 120 | 310 | 220 | 155 | Filing a brief in support of an appeal |  | 121 | 270 | 221 | 135 | Request for oral hearing |  | 138 | 1,510 | 138 | 1,510 | Petition to institute a public use proceeding |  | 140 | 110 | 240 | 55 | Petition to revive unavoidably abandoned application |  | 141 | 1,320 | 241 | 660 | Petition to revive unintentionally abandoned application |  | 142 | 1,320 | 242 | 660 | Utility issue fee (or reissue) |  | 143 | 450 | 243 | 225 | Design issue fee |  | 144 | 670 | 244 | 335 | Plant issue fee |  | 122 | 130 | 122 | 130 | Petitions to the Commissioner |  | 123 | 50 | 123 | 50 | Petitions related to provisional applications |  | 126 | 240 | 126 | 240 | Submission of Information Disclosure Stmt |  | 581 | 40 | 581 | 40 | Recording each patent assignment per property (times number of properties) |  | 146 | 790 | 246 | 395 | Filing a submission after final rejection (37 CFR 1.129(a)) |  | 149 | 790 | 249 | 395 | For each additional invention to be examined (37 CFR 1.129(b)) |  | Other fee (specify): |  |  |  |  | Other fee (specify): |  |  |  |  | SUBTOTAL (3) (\$) |  |  |  | 110.00 |
| Large Entity Fee Code   | Large Entity Fee (\$) | Small Entity Fee Code   | Small Entity Fee (\$) | Fee Description  | Fee                   |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 105   | 130                   | 205   | 65                    | Surcharge - late filing fee or oath  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 127   | 50                    | 227   | 25                    | Surcharge - late provisional filing fee or cover sheet                     |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 139   | 130                   | 139   | 130                   | Non-English specification  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 147   | 2,520                 | 147   | 2,520                 | For filing a request for reexamination                                     |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 112   | 920                   | 112   | 920                   | Requesting publication of SIR prior to Examiner action                     |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 113   | 1,840                 | 113   | 1,840                 | Requesting publication of SIR after Examiner action                        |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 115   | 110                   | 215   | 55                    | Extension for reply within first month                                     | 110.00                |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 116   | 400                   | 216   | 200                   | Extension for reply within second month                                    |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 117   | 950                   | 217   | 475                   | Extension for reply within third month                                     |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 118   | 1,510                 | 218   | 755                   | Extension for reply within fourth month                                    |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 128   | 2,060                 | 228   | 1,030                 | Extension for reply within fifth month                                     |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 119   | 310                   | 219   | 155                   | Notice of Appeal   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 120   | 310                   | 220   | 155                   | Filing a brief in support of an appeal                                     |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 121   | 270                   | 221   | 135                   | Request for oral hearing   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 138   | 1,510                 | 138   | 1,510                 | Petition to institute a public use proceeding                              |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 140   | 110                   | 240   | 55                    | Petition to revive unavoidably abandoned application                       |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 141   | 1,320                 | 241   | 660                   | Petition to revive unintentionally abandoned application                   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 142   | 1,320                 | 242   | 660                   | Utility issue fee (or reissue)   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 143   | 450                   | 243   | 225                   | Design issue fee   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 144   | 670                   | 244   | 335                   | Plant issue fee  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 122   | 130                   | 122   | 130                   | Petitions to the Commissioner  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 123   | 50                    | 123   | 50                    | Petitions related to provisional applications                              |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 126   | 240                   | 126   | 240                   | Submission of Information Disclosure Stmt                                  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 581   | 40                    | 581   | 40                    | Recording each patent assignment per property (times number of properties) |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 146   | 790                   | 246   | 395                   | Filing a submission after final rejection (37 CFR 1.129(a))                |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 149   | 790                   | 249   | 395                   | For each additional invention to be examined (37 CFR 1.129(b))             |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| Other fee (specify):  |                       |   |                       |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| Other fee (specify):  |                       |   |                       |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| SUBTOTAL (3) (\$)   |                       |   |                       | 110.00   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| <p>2. <input type="checkbox"/> Payment Enclosed:</p> <p><input type="checkbox"/> Check <input type="checkbox"/> Money Order <input type="checkbox"/> Other</p>  |                       |   |                       |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| <p>FEE CALCULATION (fees effective 10/01/97)</p> <p>1. FILING FEE</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Large Entity Fee (\$)</th><th>Small Entity Fee Code</th><th>Small Entity Fee (\$)</th><th>Fee Description</th><th>Fee Paid</th></tr></thead><tbody><tr><td>101</td><td>790</td><td>201</td><td>395</td><td>Utility filing fee</td><td></td></tr><tr><td>106</td><td>330</td><td>206</td><td>165</td><td>Design filing fee</td><td></td></tr><tr><td>107</td><td>640</td><td>207</td><td>270</td><td>Plant filing fee</td><td></td></tr><tr><td>108</td><td>790</td><td>208</td><td>395</td><td>Reissue filing fee</td><td></td></tr><tr><td>114</td><td>150</td><td>214</td><td>75</td><td>Provisional filing fee</td><td></td></tr><tr><td colspan="5">SUBTOTAL (1) (\$)</td><td></td></tr></tbody></table>   |                       | Large Entity Fee Code   | Large Entity Fee (\$) | Small Entity Fee Code  | Small Entity Fee (\$) | Fee Description       | Fee Paid              | 101             | 790 | 201                     | 395  | Utility filing fee |    | 106                                 | 330 | 206 | 165 | Design filing fee     |                       | 107  | 640                   | 207             | 270 | Plant filing fee |     | 108                       | 790                    | 208 | 395   | Reissue filing fee |       | 114                                    | 150 | 214 | 75  | Provisional filing fee |                          | SUBTOTAL (1) (\$)                                      |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| Large Entity Fee Code   | Large Entity Fee (\$) | Small Entity Fee Code   | Small Entity Fee (\$) | Fee Description  | Fee Paid              |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 101   | 790                   | 201   | 395                   | Utility filing fee   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 106   | 330                   | 206   | 165                   | Design filing fee  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 107   | 640                   | 207   | 270                   | Plant filing fee   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 108   | 790                   | 208   | 395                   | Reissue filing fee   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 114   | 150                   | 214   | 75                    | Provisional filing fee   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| SUBTOTAL (1) (\$)   |                       |   |                       |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| <p>2. CLAIMS</p> <table border="1"><thead><tr><th>Total Claims</th><th>Extra</th><th>Fee from below</th><th>Fee Paid</th></tr></thead><tbody><tr><td>10</td><td>-20**</td><td>X</td><td></td></tr><tr><td>Independent Claims 5(4)</td><td>-3**</td><td>1 X</td><td>82</td></tr><tr><td>Multiple Dependent Claims</td><td></td><td></td><td></td></tr></tbody></table> <p>** or number previously paid, if greater. For reissues see below</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Large Entity Fee (\$)</th><th>Small Entity Fee Code</th><th>Small Entity Fee (\$)</th><th>Fee Description</th></tr></thead><tbody><tr><td>103</td><td>22</td><td>203</td><td>11</td><td>Claims in excess of 20</td></tr><tr><td>102</td><td>82</td><td>202</td><td>41</td><td>Independent claims in excess of 3</td></tr><tr><td>104</td><td>270</td><td>204</td><td>135</td><td>Multiple dependent claim</td></tr><tr><td>109</td><td>80</td><td>209</td><td>40</td><td>**Reissue independent claims over original patent</td></tr><tr><td>110</td><td>22</td><td>210</td><td>11</td><td>**Reissue claims in excess of 20 and over original patent</td></tr><tr><td colspan="5">SUBTOTAL (2) (\$)</td><td>82.00</td></tr></tbody></table> |                       | Total Claims  | Extra                 | Fee from below   | Fee Paid              | 10                    | -20**                 | X               |     | Independent Claims 5(4) | -3** | 1 X                | 82 | Multiple Dependent Claims           |     |     |     | Large Entity Fee Code | Large Entity Fee (\$) | Small Entity Fee Code                                  | Small Entity Fee (\$) | Fee Description | 103 | 22               | 203 | 11                        | Claims in excess of 20 | 102 | 82    | 202                | 41    | Independent claims in excess of 3      | 104 | 270 | 204 | 135                    | Multiple dependent claim | 109  | 80 | 209 | 40    | **Reissue independent claims over original patent | 110   | 22  | 210 | 11  | **Reissue claims in excess of 20 and over original patent | SUBTOTAL (2) (\$) |    |  |        |     | 82.00 |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| Total Claims  | Extra                 | Fee from below  | Fee Paid              |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 10  | -20**                 | X   |                       |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| Independent Claims 5(4)   | -3**                  | 1 X   | 82                    |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| Multiple Dependent Claims   |                       |   |                       |  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| Large Entity Fee Code   | Large Entity Fee (\$) | Small Entity Fee Code   | Small Entity Fee (\$) | Fee Description  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 103   | 22                    | 203   | 11                    | Claims in excess of 20   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 102   | 82                    | 202   | 41                    | Independent claims in excess of 3  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 104   | 270                   | 204   | 135                   | Multiple dependent claim   |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 109   | 80                    | 209   | 40                    | **Reissue independent claims over original patent                          |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| 110   | 22                    | 210   | 11                    | **Reissue claims in excess of 20 and over original patent                  |                       |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |
| SUBTOTAL (2) (\$)   |                       |   |                       |  | 82.00                 |                       |                       |                 |     |                         |      |                    |    |                                     |     |     |     |                       |                       |  |                       |                 |     |                  |     |                           |                        |     |       |                    |       |  |     |     |     |                        |                          |  |    |     |       |   |       |   |     |     |   |                   |    |  |        |     |       |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |                      |  |  |  |  |                   |  |  |  |        |

| SUBMITTED BY          |   | Complete (if applicable) |        |
|-----------------------|---|--------------------------|--------|
| Typed or Printed Name | Bennett J. Berson   | Reg. Number              | 37,094 |
| Signature             |  | Deposit Account User ID  |        |
| Date                  | October 5, 1998   |                          |        |

GBMAD171849



I hereby certify that this correspondence is being deposited with the United States Postal Service on the date set forth below as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Date of Signature and Deposit: October 5, 1998

*[Signature]*

PATENT

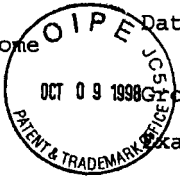
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark E. Cook Date: October 5, 1998  
Daria L. Jerome

Serial No.: 09/037,690 OCT 09 1998 Group Art Unit: 1644

Filed: 03/10/98

For: METHOD OF IMPROVING THE File No.: 960296.94011  
GROWTH OR THE EFFICIENCY (now 960296.95297)  
OF FEED CONVERSION OF AN  
ANIMAL AND COMPOSITIONS  
FOR USE THEREIN



7/a  
H.Q.  
10/29/98

RESPONSE

Assistant Commissioner For Patents  
Washington DC 20231

Dear Sir:

In response to an Office Action mailed June 4, 1998,  
please amend the application as follows:

In the Specification:

Page 1, lines 6-7, delete "which will issue as" and insert  
therefor --now --;

Page 1, line 7, delete "on" and insert therefor --, issued  
---

In the Claims:

✓ Please cancel Claims 3-5, amend Claims 1 and 8, and add  
new Claim 11, as follows:

1. (Amended) A method to improve the growth of an  
animal or the efficiency of an animal to convert feed into  
desired body tissue, said method comprising feeding an animal  
an effective amount of animal feed particles comprising an

a

14

inner core of nutrients and having an outer surface, and a layer [comprising antibodies] consisting essentially of unencapsulated antibodies on the outer surface of the inner core,

B  
a'  
cont  
said antibodies being antibodies that can passively immunize the animal against the adverse effects of [an antigen] <sup>endogenous</sup> ~~an indigenous~~ gut peptide which could reduce the animal's ability to grow or to efficiently convert its feed into desirable body tissue, wherein the method achieves superior growth or feed conversion than a second method wherein a comparable amount of the antibody is fed to the animal in an unpelleted form.

5. (Amended) A particulate animal feed comprising an inner core of nutrients, the core having an outer surface, and a layer [of antibodies] consisting essentially of at least one unencapsulated antibody to an <sup>endogenous</sup> ~~indigenous~~ gut peptide on the outer surface of the inner core.

11. (New) A method for making an animal feed, the method comprising the steps of:  
coating an antibody ~~onto~~ a surface of a particulate animal feed,  
where in the coating step the antibody is not encapsulated in a fat.

#### REMARKS

In an Office Action mailed June 4, 1998 the Examiner requested that the status of the parent application be amended, rejected Claims 8 and 9 for obviousness-type double patenting, rejected Claims 1-7 under 35 U.S.C. §112, first paragraph, and rejected Claims 1-5, 7-8, and 10 under 35 U.S.C. §103(a). Each issue raised by the Examiner is considered separately below. Reconsideration of the merits of this patent application is respectfully requested.

#### Update to Application Status

The status of the parent application, now US Patent No. 5,725,873, is updated.

### Double Patenting

The Examiner rejected Claims 8 and 9 for obviousness-type double patenting over Claim 1 of US Patent No. 5,725,873. The applicants respectfully traverse this rejection and request reconsideration. Because the patent and the pending application claim non-overlapping subject matter, the claims should be patentably distinct from one another.

Claim 1 of the '873 patent requires that the animal feed has an outer layer of an edible fat having cholecystokinin (CCK) antibodies encapsulated therein. The pending claims specifically require that the layer on the outer surface of the particles consist essentially of unencapsulated antibodies. The claims are amended to clarify this distinction which is noted in the specification. As the applicants described, an antibody to a gut peptide surprisingly retains immunological activity and is not destroyed by antibody-destroying factors, even if the antibody is simply applied to the exterior of the pellet core without encapsulation in a protective fat layer (page 3, lines 1-7). In the prior patent, issued to the same inventors, the antibody was encapsulated in fat to protect it, and the fat provided a liquid media useful to apply the antibody by spraying. An agitator was typically used to maintain a uniform mix of the encapsulated antibody in the fat. Surprisingly, the applicants have found that the protection thought to be required was not, in fact, required. As a result, the antibody can be added directly to the outer surface of a feed pellet and no agitating measures are used to stabilize the antibody. This development has important commercial benefits arising from reduced production costs, and is believed patentable over the prior patent.

### Rejections Under 35 U.S.C. §112, first paragraph

The Examiner rejected Claims 1-7 for an alleged lack of enablement over the full scope of the claims. The applicants respectfully traverse the Examiner's rejection because the claims are fully enabled to one of ordinary skill in the art.

The claimed invention relates to a particulate animal feed having on its surface an unencapsulated antibody to an

A

indigenous gut peptide. The specific nature of the peptide is not critical to the invention. Instead, it is notable that an antibody provided on the outer surface remains active after ingestion. A person of ordinary skill in the art can readily select from any number of gut peptides which are recognized to play a role in digestion. In support of the breadth as claimed, the applicants refer the Examiner to published PCT International Application No. PCT/US95/09227 (Pub. No. WO 96/04933), of record, wherein a number of suitable gut peptides known to those skilled in the art are described for use in a related method. In addition, related US Application No. 08/807,435 (allowed), filed prior to the instant application, describes modulating feeding behavior in animals in a method that comprises the step of feeding an antibody to a gut peptide to an animal by oral administration in order to alter a physiological effect of said peptide relating to feeding or growth behavior. At least five gut peptides are identified and are shown in the application to be effective in the method. The application evidences the ability of one skilled in the art to prepare an antibody to a gut peptide without undue experimentation in selecting the gut peptide. A copy of the prior application with a set of allowed claims is enclosed for the Examiner's convenient review.

Accordingly, the applicants maintain that a person of ordinary skill in the art is given sufficient guidance in the specification to practice the invention without undue experimentation. Reconsideration is respectfully requested.

#### Rejections Under 35 U.S.C. §103

The Examiner rejected Claims 1-5, 7-8 and 10 over US Patent No. 5,428,072 in view of US Patent No. 5,080,895, a paper by Albright et al., and US Patent No. 3,119,691. The applicants respectfully traverse the rejection because none of the cited documents discloses, teaches or suggests an antibody unencapsulated by fat on the surface of an animal feed and none teaches the effective use of such a feed to improve growth or feed efficiency.

In particular, the '072 patent does not disclose a feed pellet having CLA on its outer surface, nor is there any

discussion of an antibody to a gut peptide or how one would use same. The '895 patent discloses producing an antibody-containing egg yolk powder and feeding the powder to animals, but the patent describes antibodies raised only against pathogens or infectious agents. No antibodies to indigenous (self) gut peptides are raised and there is no suggestion in the '895 patent that antibodies against a self peptide would be effective after delivery by oral ingestion.

The Examiner is correct that Albright et al. teaches encapsulation of vitamin A in a lipid composition. However, Albright is not concerned with delivering antibodies, nor do the claims require encapsulation. Finally, Ludington et al. is generally inapplicable in that it does not mention using antibodies. Accordingly, none of the documents cited, alone or in combination can render obvious a particulate animal feed, or method for making or using same, as claimed. The Examiner is respectfully requested to reconsider these rejections, especially in view of the amended claims which are clarified to recite that the outer layer of the feed particle consists essentially of unencapsulated antibodies. The rejections were premised upon an alleged requirement for an encapsulated antibody in the outer layer.

Having responded to each ground of rejection, the applicants respectfully request reconsideration of the merits of this patent application.

Respectfully submitted,



Bennett J. Berson  
Reg. No. 37,094  
Attorney for Applicant  
QUARLES & BRADY  
P.O. Box 2113  
Madison, WI 53701-2113  
(608)251-5000

08/807,435

**CCK ANTIBODIES USED TO IMPROVE FEED EFFICIENCY**

**Inventor(s):** Mark E. Cook  
Cheryl C. Miller  
Julio L. Pimentel



CCK ANTIBODIES USED TO IMPROVE FEED EFFICIENCY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. Patent Application  
5 Serial No. 08/286,376 filed August 5, 1994.

STATEMENT REGARDING FEDERALLY  
SPONSORED RESEARCH OR DEVELOPMENT

N/A

10

FIELD OF THE INVENTION

This invention relates to eliciting biological response in mammals or poultry either by passive transfer of an antibody or upon feeding an antibody containing substance to the animal. Specifically, this invention relates to  
15 increasing food efficiency, decreasing gastrointestinal motility and decreasing satiety in animals and humans by the use of antibodies to cholecystokinin (CCK).

BACKGROUND OF THE INVENTION

20 The immune system, based on several kinds of specialized blood white cells, is a highly specific defense system that recognizes, eliminates and remembers foreign macromolecules and cells. While functioning properly, it can distinguish between "self" and "non-self" (foreign) materials. For example, it views tumor cells as non-self and hence attacks them, protecting animals  
25 against cancer-causing tumor cells as it protects against other invading macromolecules.

An antigen is a foreign substance that when introduced into an animal with a functioning immune system, can elicit a specific immune response such as the one mentioned above. Once activated the immune response involves,  
30 among other things, production of antibodies in the circulation system specific to that antigen. There are five distinct classes of antibodies which are also called immunoglobulins. The most abundant is IgG. The other four are IgM, IgA, IgD, and IgE. These antibodies combine with the antigen and act to neutralize or counter the effects of the antigen introduced into the animal.  
35 They accomplish this result by binding to the antigen thereby neutralizing it and preventing it from binding to other specific cell receptors.

The immune system can be used not only to fight off pathogenic antigens or harmful foreign molecules, but can be manipulated in order to elicit favorable responses which are not naturally occurring. For example, naturally occurring proteins in an animal can be neutralized via introduction of antibodies specific to that protein thereby neutralizing that protein's normal physiological affect on the animal's system.

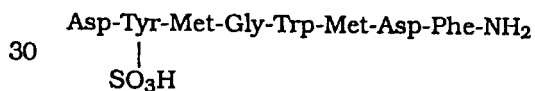
There are several ways in which an animal becomes immune responsive. For example, some antibodies are able to traverse the placenta from a mother's circulation to that of her fetus. As a result, the progeny of that mother receives natural immune protection by "inheriting" the mother's own antibodies before birth.

A second way to elicit an immune response is through introduction of an antigen into one animal, resulting in that animal developing specific antibodies to that antigen. These antibodies can then be isolated from the animal and introduced into a second animal resulting in the second animal having antibody that can bind the specific antigen.

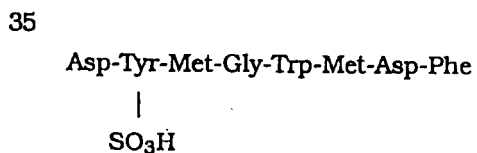
#### BRIEF SUMMARY OF THE INVENTION

This invention pertains to eliciting an immune response in animals and humans in order to increase food efficiency. The antibody used in this invention is an antibody specific to the peptide cholecystokinin (CCK). The cholecystokinin antibody (CCK antibody), upon introduction to the animal, causes an increased efficiency of converting food to body weight gain and through an apparent decreased gastrointestinal motility thereby increasing food efficiency.

The CCK peptide is as follows:



The CCK peptide can also be in a non-amide form:





CCK is an octapeptide that has been shown to negatively affect food intake and thus inhibit growth in both mammals (Gibbs et al, 1973) and birds (Savory and Hodgkiss, 1984). CCK antibodies have been successfully produced endogenously in pigs (Pekas and Trout, 1990; Pekas 1991) and rats (MacLaughlin et al, 1985). In both species, the adverse effects of CCK on food intake and weight gain were prevented by endogenous circulation of CCK antibodies.

The effects of CCK in domestic fowls is well known (Savory et al, 1981). CCK represents a polypeptide hormone which is released when food enters the small intestine. The presence of CCK in the gut mucosa alters gastrointestinal (GI) motility. The gizzard controls the rate in which food travels through the intestine and CCK, which is normally released after a meal is consumed, causes a decrease in gizzard contraction and an increase in intestinal contraction. This results in less time for the absorption of food and nutrients in the intestinal tract. The inventors have found that transferring CCK antibody to poultry increases feed efficiency. In other words, the birds gain more weight per pound of food.

The presence of CCK also alters the willingness to eat. CCK is responsible for what is known as the satiety effect which is a physiological effect that sharply decreases an avian's appetite. If an antibody combines with CCK, CCK is neutralized, the satiety effect is inhibited and adverse effects of endogenous CCK on gastrointestinal motility is averted. Thus, the avian gains more weight per unit of intake. It has not previously been seen that CCK antibodies function in avians or function orally and are actually able to neutralize the negative affects of CCK.

Neuropeptide Y and bombesin have similar physiological effects to CCK on mammalian systems and avian systems. These neuropeptides are also found in the gut and alter feeding behavior.

The effect of CCK antibodies on food efficiency and weight gain can be achieved by (1) passively transferring the CCK antibodies from the dam to offspring, (e.g. by injecting the breeder hen such that the offspring have increase levels of CCK antibody); (2) by feeding a yolk product high in CCK antibody directly to the animal; or (3) injecting a substance high in CCK antibody directly to the animal.

The method in which an immune response is achieved passively involves inoculating a female avian with a specific antigen which results in passively transferring the antibody to the female's offspring. This passive transfer of antibodies to CCK from the dam to the progeny resulting in  
5 improved conversion of food into body weight has not previously been seen in the art.

This invention also relates to a specific antibody containing substance produced from the egg of a hen immunized against a selected antigen wherein the substance is mixed with feed and subsequently fed to poultry to elicit  
10 altered but improved physiological response. Antibodies to CCK can be produced in laying hens, passed to the yolk, harvested from the yolk or fed as dried yolk, and used as a feed additive for improving feed efficiency in poultry has also not been previously appreciated in the art.

This invention has many advantages. One advantage is that  
15 individuals in the commercial meat industry can achieve market weight in livestock or poultry using less time and less feed thereby drastically reducing costs.

A second advantage to the present invention is that the CCK antibodies neutralize CCK but have no known harmful side affects and do not appear to  
20 affect meat quality. Also, the cost of utilizing this invention, even on a large scale, is relatively low since only .1 to 1 CCK antibody-containing egg is required per eight pounds of feed.

In addition, using the method of feeding the antibody to domesticated animals is relatively low in labor costs since the antibody can simply be mixed  
25 with feed and thus, not every individual animal must be injected with the antibody. Also, there is no need to separate or isolate the antibody from the egg since whole egg or yolk can simply be spray dried and fed directly.

Another advantage of this invention is that it counteracts the negative affect of feeding raw soybean meal to poultry or livestock. For example, a  
30 typical chick diet contains 40% soybean meal. However, raw soybean meal cannot be fed to poultry because it contains trypsin inhibitor which inhibits the ability of trypsin to digest protein. Therefore, raw soybean meal causes increased levels of CCK with a concurrent decrease in feed efficiency. In order to counter this effect, soybeans must be heat treated in order to be fed to  
35 poultry. The typical process for preparing soybean involves heating the beans, extracting the oils and using the remaining meal for chick feed. Specifically,

the beans must be heated to at least 121°C for approximately 20-40 minutes. There are several problems associated with preparing soybeans for poultry feed. One is that the heating process must be performed at an extremely high temperature to ensure destruction of the trypsin inhibition factor. Secondly, heating has a negative impact on the quality of proteins in the soy meal and makes the denatured protein difficult to digest properly. However, the inventors have found that CCK antibodies protect against the negative effects of feeding raw soybeans to fowl.

In addition to soybean, there are a number of other plants that contain trypsin inhibitor, including wheat, barley, lima beans and various legumes. It is predicted that the CCK antibody will also protect against the negative affects of feeding products made from wheat, barley, lima bean or legumes to poultry or livestock.

This invention also has many advantages over what is currently being used in the poultry and livestock industries. Antibiotics are currently used in the commercial animal industry in order to increase food efficiency and weight gain. However, antibiotics leave a drug residue in the animal's tissue. Therefore, the animal must go through "withdrawal time". Withdrawal time is an amount of time sufficient for the antibiotic to clear animal tissues. During withdrawal time, the animal cannot be slaughtered for human consumption. Additionally, any eggs or milk produced cannot be utilized for human use. This precaution is utilized because of the concern that human consumption of milk with traces of penicillin, for example, will cause increase resistance to antibiotics in man, eventually rendering the use of antibiotics to fight bacterial diseases useless.

Secondly, the use of antibiotics over a long period of time can potentially cause an increased number of microorganisms able to infect an animal because these organisms slowly gain resistance due to constant exposure to the antibiotic. Thus, future bacterial diseases will be difficult if not impossible to treat.

CCK also has the same effects of increased GI motility and satiety inhibition in mammals (Pekas and Trout, 1990). It is a well known fact that mammalian species passively transfer antibodies to their progeny as do avians and that mammals respond to CCK autoimmunization as do avians. The dam's antibodies are also identical to those passively transferred to the progeny in avians as well as mammals. Similarly, feeding raw soybean exerts analogous

increases in CCK production in mammals as it does in birds (Weller et al, 1990; Chohen et al, 1993; Can J An Sci 73; 401). Therefore, based on the aforementioned facts, the protective effects of actively fed and passively transferred CCK antibodies against satiety and poor feed conversion resulting from CCK observed in avians would also be seen in mammals. Using CCK on various livestock such as cattle and swine would drastically increase their final weight using the same amount of animal meal. Thus the costs to produce an animal of market size is decreased and this would have an enormously beneficial effect on the livestock industry.

10       The invention would be highly beneficial to humans who are underweight or have problems maintaining their weight. Additionally, individuals with eating disorders would benefit from this invention because their food intake could be controlled.

As previously stated, there are other gastrointestinal peptides or hormones which have an effect on an animal's feeding behavior and digestion. The example of CCK and the method of using CCK antibodies directed toward that peptide in order to prevent CCK's adverse effects suggests that similar responses could be achieved using other antibodies specific to gastrointestinal peptides or hormones. For example, gastrin is involved in signaling acid secretion into the gut and has a trophic action on gastric mucosa leading to hyperplasia. An antibody to gastrin could be used to decrease acid secretion in animals with gastric ulcers or in cases where there is gastric ELC cell carcinoid tumors due to prolonged hypergastrinemia. Gut somatostatin inhibits food intake in fed animals as well as many other gut activities. An antibody to somatostatin could prevent its inhibitory activities. Bombesin stimulates a release of CCK. One could hypothesize that inhibiting bombesin using an antibody specific to bombesin may result in responses similar to antibodies specific to CCK. Neuropeptide Y has been reported to be a stimulus in feeding. It may be possible to inhibit its activity and regulate obesity in animals prone to develop such problems. The biological activity of other peptides which regulate intestinal motility and other functional properties of the intestine could be regulated using the technology described.

In general, by generating antibodies to peptides, hormones, cytokines, etc. that regulate biochemical, metabolic, physiological, and/or behavioral processes, it may be possible to regulate or alter an animal's system to compensate for a physical abnormality or accentuate a normal function.

#### DETAILED DESCRIPTION OF THE INVENTION

As previously mentioned, there are three modes in eliciting an immune response to CCK in mammals or poultry: passive transfer, active feeding, and active inoculation.

5       The mode of this invention which relates to passively transferring antibodies involves injecting laying hens with CCK wherein the hens produce antibodies specific to CCK and, as a result, those antibodies are then passively transferred into the egg yolk of eggs laid by the hens. The chick embryo absorbs the CCK antibody during embryonic development. Thereafter, the CCK  
10 antibodies become circulating in the hatched chick's bloodstream as well as passed to the gastrointestinal tract.

      Either purified CCK or synthesized CCK peptide can be used. Well known means in the art can be used for purifying the CCK peptide such as fractionization, chromatography, precipitation or extraction. However, CCK  
15 should be conjugated with a carrier or foreign protein for use as the antigen. CCK alone has a molecular weight less than 1,500 Daltons. In order to invoke an immune response, a molecular weight of at least 10,000 Daltons is required. Therefore, the CCK peptide should be conjugated with a carrier protein with a  
20 conjugate to elicit an immune response. Carriers include a wide variety of conventionally known substances but commonly entail bovine gamma globulin or keyhole limpet hemocyanin.

      The CCK peptide conjugated to its carrier protein is injected into the target animal with a common adjuvant. The CCK-carrier conjugate can be  
25 emulsified in Freund's complete adjuvant, for example. If mammals are the target animals, then subsequent inoculations should consist of incomplete adjuvant.

      Another mode of this invention involves orally feeding a CCK antibody containing substance produced from eggs of a CCK vaccinated hen. The CCK  
30 antibody containing eggs are prepared and mixed into animal meal. Poultry or mammals which consume this antibody containing meal soon show beneficial response by preventing the satiety effects specific to CCK.

      The production of CCK antibody for oral administration can be done by utilizing known technology for producing antibodies in egg yolks. In that  
35 process, hens are challenged by injecting them with CCK conjugated to a carrier protein. In response to exposure to the CCK antigen, the eggs laid by

these hens contain high levels of CCK antibody in the yolk. Automated systems then separate and spray dry the yolks into a powder. The yolks can alternatively be lyophilized. This standard technique is well established in the art for producing various antibodies for other purposes (e.g. diagnoses,

5 resistance to pathogens, etc.)

Whole eggs may be used and it is therefore not necessary to separate the yolk from the albumen. Typically, .1 to 1 CCK containing egg is used per 8 pounds of feed.

10 Chickens are the most preferable source of eggs but eggs from turkeys, geese, ducks and the like may also be used.

While eggs are the logical source of massive quantities of antibodies, it is possible to collect the antibodies from whole blood, plasma or serum when chickens are processed for meat. In addition, whole blood, plasma or serum from inoculated livestock may be another source of antibodies as well as milk  
15 derived from an inoculated cow or goat. Additionally, another source of antibody production is through cell fusion using hybridoma techniques, genetically altered cell cultures or fermentation using recombinant technology.

A third mode of this invention is via inoculation. CCK antibodies can be directly injected into a target animal in order to elicit the desired response of  
20 satiety and improved feed conversion.

The target animal receiving the CCK antibody varies greatly. Commercial animals such as livestock, poultry and pelt-animals (e.g. mink, sable, etc.) are ideal candidates. Additionally, humans who have difficulty  
25 gaining weight are also considered within the scope of this invention.

#### **PASSIVELY TRANSFERRED CCK ANTIBODIES ON PERFORMANCE OF YOUNG LEGHORN CHICKS.**

##### **Example 1**

##### **Methods**

30 Cholecystokinin (CCK-8) (Fragment 26-33 amide with sulfated tyrosine) was conjugated to keyhole limpet hemocyanin (KLH) using glutaraldehyde and was emulsified with Freund's complete adjuvant (1:1) and injected (100ug CCK) into 11 Single Comb White Leghorn laying hens. A  
second injection of the CCK-8 conjugate in Freund's incomplete adjuvant was  
35 injected 7 days after primary injection. Another group of control hens which did not receive the CCK injection were also used. Hens (control and CCK injected) were fertilized (artificially using semen collected from New Hampshire

roosters). Fertile eggs collected 5 months after the initial injection were used to determine chick performance as a result of passively transferred CCK antibodies. Fifteen chicks hatched from the control hens and 15 chicks hatched from the CCK injected hens were raised in battery brooders on corn-soybean meal based diets for 6 weeks. Body weight gain and feed consumption data were collected.

### Results

Chicks from CCK injected hens had improved feed conversion (less feed per pound of gain) which was 14% better than chicks from the control hens. Also, feed intake was increased in CCK birds. The results are shown as Table I.

**TABLE I**

| Antibody         | 6            |               | 6              |               | 6                 |               |
|------------------|--------------|---------------|----------------|---------------|-------------------|---------------|
|                  | Week         | %             | Week           | %             | Week              | %             |
| <u>Treatment</u> | <u>Gain*</u> | <u>Change</u> | <u>Intake*</u> | <u>Change</u> | <u>Conversion</u> | <u>Change</u> |
| Control          | 297          |               | 745            |               | 2.51              |               |
| CCK              | 352          | +18           | 756            | +1            | 2.15              | -14           |

\*Body weight, body wt gain and feed intake are measured in grams.

### Example 2

#### Methods

Eggs from hens immunized with CCK (as shown in Example 1) and from control hens were collected at approximately 10 months after the primary inoculation. Two pens of 13 chicks (representing both the control and CCK immunized hens) were fed a corn-soybean meal based diet to determine if passively transferred CCK antibodies would influence performance as seen in Example 1. Birds were raised for 4 weeks. Body weights and feed consumption were determined.

### Results

Feed conversion was improved 2% in chicks from CCK immunized hens when compared to chicks from control hens. The results are shown as Table II.

**TABLE II**

| Treatment | 4    |    | Intake* | 4    |   | Conversion | Change |
|-----------|------|----|---------|------|---|------------|--------|
|           | Week | %  |         | Week | % |            |        |
| Control   | 158  |    | 383     |      |   | 2.42       |        |
| CCK       | 151  | -4 | 360     | -6   |   | 2.38       | -2     |

\*Body weight, body wt gain and feed intake are measured in grams.

### **Example 3**

#### **10 Methods**

Fertile eggs were collected approximately 8 months after primary inoculation from control and CCK injected hens (immunization as described in Example 1) and used to study the effects of CCK immunization on progeny performance. Two pens of 17 progeny chicks per pen from CCK injected hens and 2 pens of 17 progeny chicks per pen from control hens were raised for 4 weeks. Body weight and feed consumption were measured.

#### **Results**

Chicks from CCK injected hens had a 5.2% improvement in feed conversion than chicks from control hens. The results are shown as Table III.

**TABLE III**

| Treatment | 4    |   | Intake* | 4    |   | Conversion | Change |
|-----------|------|---|---------|------|---|------------|--------|
|           | Week | % |         | Week | % |            |        |
| Control   | 246  |   | 473     |      |   | 1.92       |        |
| CCK       | 245  | 0 | 447     | -5.5 |   | 1.82       | -5.2   |

\*Body weight, body wt gain and feed intake are measured in grams.

#### **30 Example 4**

##### **Methods**

In this study, 2 pens of 15 chicks per pen from CCK immunized hens (as shown in Example 1 and 7 months following the hen's primary inoculation) and 2 pens of 12 chicks per pen from control hens were raised on a corn-soybean meal based diet supplemented with 5% raw soybeans for 3 weeks (raw soybeans were used to stimulate CCK production). Body weight and feed consumption were measured.



### **Results**

Chicks from CCK injected hens had a 10% improvement in feed conversion when compared to chicks from control hens. The results are shown in Table IV.

5

**TABLE IV**

|                         | 3                     |                      | 3                     |                      | 3                        |                      |
|-------------------------|-----------------------|----------------------|-----------------------|----------------------|--------------------------|----------------------|
|                         | Week                  | %                    | Week                  | %                    | Week                     | %                    |
| <b><u>Treatment</u></b> | <b><u>Weight*</u></b> | <b><u>Change</u></b> | <b><u>Intake*</u></b> | <b><u>Change</u></b> | <b><u>Conversion</u></b> | <b><u>Change</u></b> |
| 10 Control              | 169                   |                      | 395                   |                      | 2.34                     |                      |
| CCK                     | 161                   | -5                   | 338                   | -14                  | 2.10                     | -10                  |

\*Body weight, body wt gain and feed intake are measured in grams.

15

### **PROTOCOL FOR THE EFFECTS OF PASSIVELY TRANSFERRED CCK ANTIBODY ON THE PERFORMANCE OF YOUNG BROILER CHICKS.**

#### **Example 5**

#### **Methods**

Broiler breeders were immunized with CCK conjugated to KLH using the protocol described in example 1. Since these breeders were maintained on the floor, fertile eggs were produced as a result of natural matings. A total of 10 hens received the CCK immunization (antigen prepared as in example 1 for Leghorns), and 10 hens served as controls. Approximately 21 to 30 days after the primary inoculation, fertile eggs were collected from the control and CCK immunized hens. Seven broiler chicks from the control hens and 7 broiler chicks from the CCK injected hens were hatched and raised in a battery brooder for 3 weeks. Body weight and feed consumption were measured.

25

#### **Results**

Feed conversion was improved 20% and body weight 8% in broiler chicks from CCK immunized hens as compared to broiler chicks from control hens. See Table V for results.

30

**TABLE V**

|                         | 3                     |                      | 3                     |                      | 3                        |                      |
|-------------------------|-----------------------|----------------------|-----------------------|----------------------|--------------------------|----------------------|
|                         | Week                  | %                    | Week                  | %                    | Week                     | %                    |
| <b><u>Treatment</u></b> | <b><u>Weight*</u></b> | <b><u>Change</u></b> | <b><u>Intake*</u></b> | <b><u>Change</u></b> | <b><u>Conversion</u></b> | <b><u>Change</u></b> |
| 35 Control              | 396                   |                      | 604                   |                      | 1.53                     |                      |
| CCK                     | 427                   | +8                   | 526                   | -13                  | 1.23                     | -20                  |

40 \*Body weight, body wt gain and feed intake are measured in grams.

**Example 6**

**Methods**

Two pens of 6 chicks from CCK immunized broiler breeders 7 weeks after the primary inoculation as in Example 5 and 2 pens of 6 chicks per pen from the control hens were hatched and raised to 3 weeks of age on a standard broiler type diet. Body weight and feed consumption were measured.

**Results**

Broiler chicks from CCK immunized hens gained 16% more body weight and converted food 12.5% more efficiently than chicks from the control hens. See Table VI for results.

**TABLE VI**

|           | 3       |        | 3       |        | 3          |        |
|-----------|---------|--------|---------|--------|------------|--------|
|           | Week    | %      | Week    | %      | Week       | %      |
| Treatment | Weight* | Change | Intake* | Change | Conversion | Change |
| Control   | 380     |        | 547     |        | 1.44       |        |
| CCK       | 441     | +16    | 547     | 0      | 1.26       | -12.5  |

\*Body weight, body wt gain and feed intake are measured in grams.

**FEEDING EGG YOLKS FROM CONTROL AND CCK IMMUNIZED HENS.**

**Example 7**

**Methods**

Control or CCK immunized hens were prepared as described in Example 1. Eggs from control and CCK immunized hens were collected after at least 21 days following the primary inoculation. Yolks were collected from the eggs (albumen was discarded) and control or anti-CCK yolks were separately pooled, frozen, then freeze dried. The control and CCK antibody dried yolks were then ground and added to a standard corn-soybean based diet at .5, 1.0, or 5% of the diet (weight by weight) creating 3 control treatments and 3 anti-CCK treatments. Each dietary treatment was fed to two pens of 9 leghorn type chicks for 4 weeks. Body weight gains, feed consumption, and feed conversion were determined.

### Results

As the level of anti-CCK egg yolk increased, body weight gain increased relative to those fed the control egg yolk. At each level of anti-CCK egg yolk feeding, feed conversion was improved over those fed the control yolk. See

5 Table VII for results.

**TABLE VII**

-----0-4 weeks of age-----

|    | <u>Treatment</u> | <u>% Fed</u> | <u>Feed Intake*</u> | <u>Feed Conversion</u> |
|----|------------------|--------------|---------------------|------------------------|
| 10 | Control Yolk     | .5           | 692                 | 2.88                   |
|    | CCK Yolk         | .5           | 680                 | 2.50                   |
|    | Control Yolk     | 1.0          | 656                 | 2.39                   |
|    | CCK Yolk         | 1.0          | 649                 | 2.29                   |
|    | Control Yolk     | 5            | 712                 | 2.55                   |
| 15 | CCK Yolk         | 5            | 772                 | 2.49                   |

\*Body weight, body wt gain and feed intake are measured in grams.

### **EFFECTS OF PASSIVELY TRANSFERRING CCK ANTIBODY IN PREVENTING THE NEGATIVE EFFECTS OF FEEDING RAW SOYBEANS ON FEED CONVERSION.**

20

#### Example 8

#### Methods

Immunized hens (Leghorns) were prepared as described in Example 1. Hens were artificially fertilized and eggs were collected and incubated. Chicks  
25 (Single Comb White Leghorn X New Hampshire) were hatched and 2 pens of 12 chicks were assigned to each of 4 treatments. The treatments included 2 sources of chicks (progeny from control or CCK immunized hens) factorially arranged with 2 dietary treatments (5 or 10% raw soybeans at the expense of diet). The chicks were fed the diets for 4 weeks and body weight and feed  
30 consumption were measured.

#### Results

Chicks from CCK immunized hens had improved feed conversion (11% to 19%) when compared to their respective control diets. As the level of raw  
35 soybeans increased in the diet, feed conversion was poorer (12% poorer in the control progeny, but only 6% poorer in the progeny chicks from the CCK injected hens). See Table VIII for results.

**TABLE VIII**

|    | % Raw Soybean | Passive CCK Antibody | 4 Week Weight* | % Change | 4 Week Conversion | % Change |
|----|---------------|----------------------|----------------|----------|-------------------|----------|
| 5  |               | -                    | 202            |          | 2.63              |          |
| 5  |               | +                    | 205            | +1.5     | 2.34              | -11      |
| 10 |               | -                    | 192            |          | 2.94              |          |
| 10 |               | +                    | 197            | +2.6     | 2.48              | -19      |

\*Body weight, body wt gain and feed intake are measured in grams.

10

# **FEEDING ANTI-PEPTIDES TO BROILER CHICKS**

## **Example 9**

**Summary:** Broiler chicks were purchased from an outside vendor and fed various antibodies to peptides of GI tract to establish any type of phenomena that may occur related to body weight and/or feed conversion.

15

## **Animals:**

|                |  |
|----------------|--|
| Species:       | Broiler Chicken                            |
| Strain:        | Avian X Avian                              |
| Source:        | Northern Hatcherles (Beaver Dam, WI)       |
| Vaccinations:  | Mareks, Gumboro, New Castle/Bronchitis, AE |
| Sex:           | Male                                       |
| Number of each | 32   |

## **Feeding Protocol (Treatments)**

20 **Diets:**

(g/kg)

|                | Peptide Identification | Lot Number | 0.5 |
|----------------|------------------------|------------|-----|
| bGG Control    | N3 Control             | E-457A     | X   |
| Bombesin       | P6                     | P6-32995   | X   |
| Motilin        | P7                     | P7-32995   | X   |
| Neuropeptide Y | P8                     | P8-32995   | X   |

**Trial Set-Up:**

| Number of Pens     | Birds per Pen       | Floor | Battery |
|--------------------|---------------------|-------|---------|
| 8                  | 4                   |       | X       |
| Pens per Treatment | Birds per Treatment |       |         |
| 2                  | 8                   |       |         |

**Results:**

| Treatment      | 3 Week Body Wt (g) | 0-3 Body Wt Gain (g) | 0-3 Feed/Bird | 0-3 Feed/Gain |
|----------------|--------------------|----------------------|---------------|---------------|
| Control        | 543                | 503                  | 786           | 1.56          |
| Bombesin       | 530                | 490                  | 774           | 1.58          |
| Motilin        | 554                | 494                  | 795           | 1.61          |
| Neuropeptide Y | 537                | 495                  | 711           | 1.44          |

- 5           The above data show that chicks fed bombesin, motilin and neuropeptide Y all show weight gain comparable to control. In particular, the use of neuropeptide Y results in substantially the same weight gain over time as control, but with significantly less feed than control.

10           **FEEDING AVENO AND NEUROPEPTIDE Y TO BROILER CHICKS**

**Example 10**

**Summary:** Broiler chicks were hatched from UW stock and fed yolk from hens injected with Aveno or Neuropeptide Y when compared to control powder from N3 series.

**Animals:**

|                 |                       |
|-----------------|-----------------------|
| Species:        | Broiler Chicken       |
| Strain:         | Petersen X Arbor Acre |
| Source:         | UW Stock              |
| Vaccinations:   | None                  |
| Sex:            | Mixed                 |
| Number of each: | 175                   |

**Feeding Protocol (Treatments)**

(g of egg yolk antibody  
powder per kg feed)

**5 Diets:**

|                | Peptide Identification | Lot Number | 0.25 | 0.5 | 1.0 |
|----------------|------------------------|------------|------|-----|-----|
| bGG Control    | N3 Control             | E457A      |      | X   |     |
| Reverse Bravo  | P10                    | P10-61695  |      | X   | X   |
| Aveno          | P11                    | P11-61695  |      | X   | X   |
| Neuropeptide Y | P8                     | P8-32995   | X    | X   |     |

**Trial Set-up:**

| Number of Pens     | Birds per Pen       | Floor | Battery |
|--------------------|---------------------|-------|---------|
| 35                 | 5                   |       | X       |
| Pens per Treatment | Birds per Treatment |       |         |
| 5                  | 25                  |       |         |

**Results: Feed Conversions**

| Treatment        | 1-3 Feed/Gain |
|------------------|---------------|
| Control (0.5)    | 1.63          |
| Aveno (0.5)      |               |
| Aveno (1.0)      |               |
| Reverse (0.5)    |               |
| Reverse (1.0)    |               |
| Peptide 8 (0.25) | 1.58          |
| Peptide 8 (0.5)  | 1.71          |

**Note:** This trial started when the birds were one week of age, therefore we will not have a 0-2 feed/gain.

| Treatment (g yolk/kg feed) | 3 Wk Weight (gain) (g) |
|----------------------------|------------------------|
| Control                    | 418 (328)              |
| Aveno (0.5)                |                        |
| Aveno (1.5)                |                        |
| Reverse (0.5)              |                        |
| Reverse (1.0)              |                        |
| Peptide 8 (0.25)           | 475 (379)              |
| Peptide 8 (0.5)            | 442 (349)              |

- 5        These data show that feeding neuropeptide Y (Peptide 8) resulted in chicks having significantly greater weight gain versus control chicks.

**FEEDING ANTI-BRAVO ANTIBODIES TO BROILER CHICKS**

**Example 11**

- 10    **Summary:** Broiler chicks were hatched at the UW poultry research lab and fed Anti-Bravo from a specified lot of Gutteridge product (G111S) to monitor a dose response similar to these seen with the N-series products. Also monitor Peptide 8 to see if it has similar properties to Bravo.

**Animals:**

|                |                       |
|----------------|-----------------------|
| Species:       | Broiler Chicken       |
| Strain:        | Petersen X Arbor Acre |
| Source:        | UW stock              |
| Vaccinations:  | none                  |
| Sex:           | Mixed                 |
| Number of each | 75                    |

**Fertility Information:**

| Treatment | Infertile | Early Deaths | No Hatch | Hatched |
|-----------|-----------|--------------|----------|---------|
| Control   | 66        | 24           | 35       | 415     |
| Bravo     |           |              |          |         |

5

**Feeding Protocol (Treatments)**

**Diets:**

(g/kg)

|                     | Lot Number | 0.25 |
|---------------------|------------|------|
| N3 Control          | E-457A     | X    |
| Bravo (G111S)       | A2-61695   | X    |
| Peptide 8 (Neuro Y) | 32995      | X    |

**Trial Set-up: (Birds per Rx=25)**

| Number of Pens | Birds per Pen | Floor | Battery | Passive | Control (bGG) |
|----------------|---------------|-------|---------|---------|---------------|
| 15             | 5             |       | X       |         | 75            |



**Feed:**

| Rx | Control 0.25 | G111S 0.25 | Peptide 8 0.25 |
|----|--------------|------------|----------------|
| 1  | X            |            |                |
| 2  |              | X          |                |
| 3  |              |            | X              |

**Results: Feed Conversion**

| RX              | 0-1 Feed/Gain | 0-2 Feed/Gain | 0-3 Feed/Gain |
|-----------------|---------------|---------------|---------------|
| Control         | 1.66          | 1.60          | 1.96          |
| G. Bravo (0.25) | 1.67 (-1)     | 1.62 (-2)     | 1.89 (7)      |
| Peptide 8       | 1.63          | 1.61          | 1.83 (13)     |

**5 Body Weights (gains):**

| Rx              | 1 wk (gain)(g) | 2 wk (gain)(g) | 3 wk (gain)(g) |
|-----------------|----------------|----------------|----------------|
| Control         | 111 (70)       | 247 (205)      | 432 (390)      |
| G. Bravo (0.25) | 102 (61)       | 231 (190)      | 407 (366)      |
| Peptide 8       | 110 (69)       | 262 (221)      | 465 (423)      |

**Note:** These suppressions in weight gain for Bravo are probably due to the high titer of the product used.

These data show that feeding neuropeptide Y (Peptide 8) resulted in  
 10 chicks having significantly greater weight gain versus control.

**FEEDING PEPTIDES 6, 7 & 8 TO BROILER CHICKS**

**Example 12**

15 **Summary:** To determine if there is an effect in improving feed conversion when feeding any of these peptides to broiler chicks.

**Animals:**

|                |                          |
|----------------|--------------------------|
| Species:       | Broiler Chicken          |
| Strain:        | Petersen X Arbor Acre    |
| Source:        | UW Stock (Controls Only) |
| Vaccinations:  | NONE                     |
| Sex:           | Mixed                    |
| Number of each | 100                      |

**Feeding Protocol (Treatments)**

**Diets:**

(g/kg)

| Treatments                 | Lot Number | 0.25 |
|----------------------------|------------|------|
| Control                    | E457A      | X    |
| Peptide 6 (Bombesin)       | P32995     | X    |
| Peptide 7 (Motilin)        | P32995     | X    |
| Peptide 8 (Neuropeptide Y) | P32995     | X    |

5

**Trial Set-up:**

| Number of Pens     | Birds per Pen       | Floor | Battery |
|--------------------|---------------------|-------|---------|
| 20                 | 5                   |       | X       |
| Pens per Treatment | Birds per Treatment |       |         |
| 5                  | 25                  |       |         |

**Results:**

| Treatment | 0-1 Feed/Gain | 0-2 Feed/Gain | 0-3 Feed/Gain |
|-----------|---------------|---------------|---------------|
| Control   | 1.51          | 1.68          | 1.71          |
| Peptide 6 | 1.48          | 1.58          | 1.64          |
| Peptide 7 | 1.63          | 1.59          | 1.63          |
| Peptide 8 | 1.38          | 1.55          | 1.69          |

**Body Weights (grams):**

| Treatment | 1 Week   | 2 Week    | 3 Week    |
|-----------|----------|-----------|-----------|
| Control   | 119 (72) | 258 (211) | 480 (433) |
| Peptide 6 | 115 (70) | 274 (229) | 509 (463) |
| Peptide 7 | 116 (71) | 272 (226) | 505 (460) |
| Peptide 8 | 124 (78) | 296 (250) | 562 (516) |

Note: Chicks were hatched from BgG hens instead of purchased.

5

These data show that bombesin (Peptide 6), motilin (Peptide 7) and neuropeptide Y (Peptide 8) all significantly increased body weights of chicks versus control. In each case, the peptide resulted in chicks with greater body weight for the same amount of feed fed to the chicks.

10

**FEEDING PEPTIDES 6, 7 AND 8 TO RATS**

**Example 13**

**Summary:** Rats purchased from Harlan Sprague Dawley were fed antibodies to GI tract peptides from a specified lot to establish the appropriate dose level to

15 increase or decrease consumption after 72 hours.

**Animals:**

|                |                                      |
|----------------|--------------------------------------|
| Species:       | Rat                                  |
| Strain:        | Sprague Dawley                       |
| Source:        | Harlan Sprague Dawley<br>Madison, WI |
| Vaccinations:  | none                                 |
| Sex:           | Male                                 |
| Number of each | 41                                   |

**Feeding Protocol (Treatments)**

**Diets:**

(g/kg)

|             | Lot Number | 0.25 | 0.50 |
|-------------|------------|------|------|
| bGG Control | E457A      | X    |      |
| Peptide 6   | 32995      | X    | X    |
| Peptide 7   | 32995      | X    | X    |
| Peptide 8   | 32995      | X    | X    |

5

**Trial Set-up:**

| Number of Pens      | Rat per Cage | Floor | Cage |
|---------------------|--------------|-------|------|
| 41                  | 1            |       | X    |
| Cages per Treatment | 6            |       |      |

**Results:**

| Treatment (g yolk/kg feed) | 0-3 Day Consumption (g) | 0-3 Feed/Kg of Body Wt |
|----------------------------|-------------------------|------------------------|
| Control                    | 76.16                   | 205.343                |
| Peptide 6 (0.25)           | 71.2                    | 187.86                 |
| Peptide 7 (0.25)           | 71.2                    | 182.85                 |
| Peptide 8 (0.25)           | 71                      | 186.63                 |
| Peptide 6 (0.5)            | 72.5                    | 193.67                 |
| Peptide 7 (0.5)            | 70.8                    | 189.25                 |
| Peptide 8 (0.5)            | 72                      | 189.86                 |

**FEEDING BRAVO TO PIGS**

5 **Example 14**

**Summary:** Pigs were fed Bravo to establish bioactivity relating to feeding and growth behavior.

**Results:**

|            | (lbs)     | (kg)     | (kg)  | (kg)                 |                      |               |
|------------|-----------|----------|-------|----------------------|----------------------|---------------|
| Treatment* | 2 week wt | 0-2 gain | adg   | 0-2 Feed consumption | 0-2 feed/kg body wt. | 0-2 feed/gain |
| Control    | 66.3      | 10.4     | 0.741 | 19.31                | 0.638                | 1.870         |
| 0.25       | 63.8      | 9.8      | 0.703 | 19.19                | 0.663                | 1.959         |
| 0.75       | 64.7      | 10.7     | 0.763 | 19.43                | 0.661                | 1.821         |
| 2.5        | 68.3      | 11.1     | 0.790 | 20.66                | 0.660                | 1.878         |

10 \* grams of egg yolk antibody powder/kg feed

We claim:

1. A method of modulating feeding behavior in animals, comprising the step of feeding an antibody to a gut peptide to an animal in order to alter a physiological effect of said peptide relating to feeding or growth behavior.

2. The method of claim 1 wherein said gut peptide is cholecystokinin.

3. The method of claim 2 wherein said cholecystokinin is purified cholecystokinin peptide.

4. The method of claim 2 wherein said cholecystokinin is synthetic cholecystokinin peptide.

5. The method of claim 2 wherein said cholecystokinin is sulfated.

6. The method of claim 2 wherein said cholecystokinin is an amide.

7. The method of claim 2 wherein said feeding improves feed efficiency.

8. The method of claim 7 wherein said feeding improves growth rate.

9. The method of claim 1 wherein said gut peptide is bombesin.

10. The method of claim 1 wherein said gut peptide is neuropeptide Y.

11. The method of claim 1 wherein said gut peptide is gastrin.

12. The method of claim 1 wherein said gut peptide is somatostatin.

13. The method of claim 1 wherein said animal is an avian.

14. The method of claim 13 wherein said avian is a chicken.

15. The method of claim 1 wherein said animal is a mammal.

16. The method of claim 15 wherein said mammal is selected from the group consisting of a porcine, a bovid, an ovine, a caprine, a rodentia and a homo sapien.

17. A method of modulating feeding behavior in animals, comprising the steps of:

immunizing a producer animal with a gut peptide so that said producer animal produces an antibody to said gut peptide;

5 isolating a substance containing said gut peptide antibody from said producer animal; and

feeding said gut peptide antibody to an animal in order to alter growth, food efficiency, food intake or intestinal motility.

18. The method of claim 17 wherein said gut peptide is cholecystokinin.

19. The method of claim 17 wherein said gut peptide is bombesin.

20. The method of claim 17 wherein said gut peptide is neuropeptide Y.

21. The method of claim 17 wherein said gut peptide is gastrin.

22. The method of claim 17 wherein said gut peptide is somatostatin.

23. The method of claim 17 wherein said cholecystokinin is conjugated to a carrier protein.

24. The method of claim 23 wherein said carrier protein is keyhole limpet hemocyanin.

25. The method of claim 23 wherein said carrier protein is bovine gamma globulin.

26. The method of claim 23 wherein said cholecystokinin conjugated to said carrier protein has a molecular weight of at least 8,000 Daltons.

27. The method of claim 17 wherein said substance containing said gut peptide antibody is selected from the group consisting of milk, whole egg and egg yolk.

28. The method of claim 17 wherein said substance containing said gut peptide antibody is selected from the group consisting of whole blood, blood serum and blood plasma, and further including the step of separating the gut peptide antibody from said substance prior to feeding said gut peptide antibody  
5 to said animal.

CCK ANTIBODIES USED TO IMPROVE FEED EFFICIENCY  
ABSTRACT OF THE DISCLOSURE

A method of increasing food efficiency in both avians and mammals by using antibodies to gut peptides such as cholecystokinin to elicit a biological  
5 response which decreases gastrointestinal motility, reduces satiety or improves feed efficiency.





ALLOWED CLAIMS  
for  
P97060US - C,M,P

1. A method of modulating feeding behavior in animals, comprising the step of feeding an antibody to a gut peptide to an animal by oral administration in order to alter a physiological effect of said peptide relating to feeding or growth behavior.
2. The method of claim 1 wherein said gut peptide is cholecystokinin.
3. The method of claim 2 wherein said cholecystokinin is purified cholecystokinin peptide.
4. The method of claim 2 wherein said cholecystokinin is synthetic cholecystokinin peptide.
5. The method of claim 2 wherein said cholecystokinin is sulfated.
6. The method of claim 2 wherein said cholecystokinin is an amide.
9. The method of claim 1 wherein said gut peptide is bombesin.
10. The method of claim 1 wherein said gut peptide is neuropeptide Y.
11. The method of claim 1 wherein said gut peptide is gastrin.
12. The method of claim 1 wherein said gut peptide is somatostatin.
13. The method of claim 1 wherein said animal is an avian.
14. The method of claim 13 wherein said avian is a chicken.
15. The method of claim 1 wherein said animal is a mammal.
16. The method of claim 15 wherein said mammal is selected from the group consisting of a porcine, a bovid, an ovine, a caprine, a rodentia and a homo sapien.
17. A method of modulating feeding behavior in animals, comprising the steps of:
  - immunizing a producer animal with a gut peptide so that said producer animal produces an antibody to said gut peptide;
  - isolating a substance containing said gut peptide antibody from said producer animal; and
  - feeding said substance containing said gut peptide antibody to an animal by oral administration.

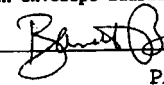
18. The method of claim 17 wherein said gut peptide is cholecystokinin.
19. The method of claim 17 wherein said gut peptide is bombesin.
20. The method of claim 17 wherein said gut peptide is neuropeptide Y.
21. The method of claim 17 wherein said gut peptide is gastrin.
22. The method of claim 17 wherein said gut peptide is somatostatin.
23. The method of claim 18 wherein said cholecystokinin is conjugated to a carrier protein.
24. The method of claim 23 wherein said carrier protein is keyhole limpet hemocyanin.
25. The method of claim 23 wherein said carrier protein is bovine gamma globulin.
27. The method of claim 17 wherein said substance containing said gut peptide antibody is selected from the group consisting of milk, whole egg and egg yolk.
28. The method of claim 17 wherein said substance containing said gut peptide antibody is selected from the group consisting of whole blood, blood serum and blood plasma.
29. The method of claim 17 further including the steps of separating the gut peptide antibody from said substance, and thereafter feeding said gut peptide antibody to said animal.
30. The method of claim 17 wherein said animal is selected from the group consisting of an avian, a porcine, a bovine, an ovine, a caprine, a rodentia and a homo sapien.



Receipt

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark E. Cook  
Daria L. Jerome

Date: October 21, 1998

Serial No.: 09/037,690

Group Art Unit: 1644

Filed: 03/10/98

Examiner: F. VanderVegt

For: METHOD OF IMPROVING THE  
GROWTH OR THE EFFICIENCY  
OF FEED CONVERSION OF AN  
ANIMAL AND COMPOSITIONS  
FOR USE THEREIN

File No.: 960296.94011  
(now 960296.95297)

REQUEST FOR CORRECTED FILING RECEIPT

Assistant Commissioner For Patents  
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Dear Sir:

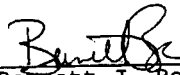
An error was noted in the Corrected Filing Receipt  
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In the title, the word "Improving" is still misspelled.

Also, the applicants respectfully request that the Office  
update the attorney docket number so that the last five digits  
are 95297, if possible.

Thank you for your attention to this request.

Respectfully submitted,

  
Bennett J. Berson  
Reg. No. 37,094  
Attorney for Applicants  
QUARLES & BRADY  
P.O. Box 2113  
Madison, WI 53701-2113  
(608) 251-5000

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| APPLICATION NUMBER | FILING DATE | GRP ART UNIT | FIL FEE REC'D | ATTORNEY DOCKET NO. | DRWGS | TOT CL | IND CL |
|--------------------|-------------|--------------|---------------|---------------------|-------|--------|--------|
| 09/037,690         | 03/10/98    | 1644         | \$1,002.00    | 960296:94011        | 0     | 10     | 4      |

95297

BENNETT J. BERSON  
QUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

Receipt is acknowledged of this patent application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Application Processing Division's Customer Correction Branch within 10 days of receipt. Please provide a copy of the Filing Receipt with the changes noted thereon.

Applicant(s) MARK E. COOK, MADISON, WI; DARIA L. JEROME, FRAZEE, MN.

CONTINUING DATA AS CLAIMED BY APPLICANT-  
THIS APPLN IS A CIP OF 08/684,785 07/22/96 PAT 5,725,873

FOREIGN FILING LICENSE GRANTED 03/27/98

TITLE  
METHOD OF IMPROVING THE GROWTH OR THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN

PRELIMINARY CLASS: 424

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(see reverse)

| PATENT TRANSMITTAL  |    | Complete if Known    |                      |
|---|----|----------------------|----------------------|
| <p>Patent forms are subject to annual revision on October 1. These are the fees effective October 1, 1997. Small Entity payments must be supported by a small entity statement otherwise large entity fees must be paid. See Forms PTO/SB/09-12</p> |    | Application Number   | 09/037,690           |
|   |    | Filing Date          | 3/10/98              |
|   |    | First Named Inventor | Mark E. Cook         |
|   |    | Group Art Unit       | 1644                 |
|   |    | Examiner Name        | F. Pierre VanderVegt |
| TOTAL AMOUNT OF   | \$ | Attorney Docket      | 960296.95297         |

| METHOD OF PAYMENT (check one)  |                       | FEE CALCULATION (continued)  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
|--|-----------------------|--|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------|-----|---------------------------|-------|--------------------|----|-------------------------------------|-----------------------|-----------------------|-----------------------|-------------------|-----|--|-----|-----|------------------------|------------------|-----|---------------------------|-----|-----------------------------------|-------|--------------------|-------|--|--------------------------|-----|-----|------------------------|-----|--|-----|-----|-------|-----|---|---|--|-----|-----|-----|----|--|--|-----|-----|-----|-----|---|--|-----|-----|-----|-----|--|--|-----|-------|-----|-----|---|--|-----|-------|-----|-------|--|--|-----|-----|-----|-----|------------------|--|-----|-----|-----|-----|--|--|-----|-----|-----|-----|--------------------------|--|-----|-------|-----|-------|---|--|-----|-----|-----|----|--|--|-----|-------|-----|-----|--|--|-----|-------|-----|-----|--------------------------------|--|-----|-----|-----|-----|------------------|--|-----|-----|-----|-----|-----------------|--|-----|-----|-----|-----|-------------------------------|--|-----|----|-----|----|---|--|-----|-----|-----|-----|---|--|-----|----|-----|----|--|--|-----|-----|-----|-----|---|--|-----|-----|-----|-----|--|--|----------------------|--|--|--|--|--|----------------------|--|--|--|--|--|-------------------|--|--|--|--|--|------------------------------------|--|--|--|--|--|
| <p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:</p> <p>Deposit Account Number: 17-0055</p> <p>Deposit Account Name: Quarles &amp; Brady</p> <p><input checked="" type="checkbox"/> Charge Any Additional Fees Required Under 37 CFR 1.16 and 1.17 <input type="checkbox"/> Charge the Issue Fee Set in 37 CFR 1.18 at the Filing of the Notice of Allowance, 37 CFR 1.311(b)</p>   |                       | <p>3. ADDITIONAL FEES</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Large Entity Fee (\$)</th><th>Small Entity Fee Code</th><th>Small Entity Fee (\$)</th><th>Fee Description</th><th>Fee</th></tr></thead><tbody><tr><td>105</td><td>130</td><td>205</td><td>65</td><td>Surcharge - late filing fee or oath</td><td></td></tr><tr><td>127</td><td>50</td><td>227</td><td>25</td><td>Surcharge - late provisional filing fee or cover sheet</td><td></td></tr><tr><td>139</td><td>130</td><td>139</td><td>130</td><td>Non-English specification</td><td></td></tr><tr><td>147</td><td>2,520</td><td>147</td><td>2,520</td><td>For filing a request for reexamination</td><td></td></tr><tr><td>112</td><td>920</td><td>112</td><td>920</td><td>Requesting publication of SIR prior to Examiner action</td><td></td></tr><tr><td>113</td><td>1,840</td><td>113</td><td>1,840</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr><tr><td>115</td><td>110</td><td>215</td><td>55</td><td>Extension for reply within first month</td><td></td></tr><tr><td>116</td><td>400</td><td>216</td><td>200</td><td>Extension for reply within second month</td><td></td></tr><tr><td>117</td><td>680</td><td>217</td><td>478</td><td>Extension for reply within third month</td><td></td></tr><tr><td>118</td><td>1,510</td><td>218</td><td>755</td><td>Extension for reply within fourth month</td><td></td></tr><tr><td>128</td><td>2,060</td><td>228</td><td>1,030</td><td>Extension for reply within fifth month</td><td></td></tr><tr><td>119</td><td>310</td><td>219</td><td>155</td><td>Notice of Appeal</td><td></td></tr><tr><td>120</td><td>310</td><td>220</td><td>155</td><td>Filing a brief in support of an appeal</td><td></td></tr><tr><td>121</td><td>270</td><td>221</td><td>135</td><td>Request for oral hearing</td><td></td></tr><tr><td>138</td><td>1,510</td><td>138</td><td>1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr><tr><td>140</td><td>110</td><td>240</td><td>55</td><td>Petition to revive unavoidably abandoned application</td><td></td></tr><tr><td>141</td><td>1,320</td><td>241</td><td>660</td><td>Petition to revive unintentionally abandoned application</td><td></td></tr><tr><td>142</td><td>1,320</td><td>242</td><td>660</td><td>Utility issue fee (or reissue)</td><td></td></tr><tr><td>143</td><td>450</td><td>243</td><td>225</td><td>Design issue fee</td><td></td></tr><tr><td>144</td><td>670</td><td>244</td><td>335</td><td>Plant issue fee</td><td></td></tr><tr><td>122</td><td>130</td><td>122</td><td>130</td><td>Petitions to the Commissioner</td><td></td></tr><tr><td>123</td><td>50</td><td>123</td><td>50</td><td>Petitions related to provisional applications</td><td></td></tr><tr><td>126</td><td>240</td><td>126</td><td>240</td><td>Submission of Information Disclosure Stmt</td><td></td></tr><tr><td>581</td><td>40</td><td>581</td><td>40</td><td>Recording each patent assignment per property (times number of properties)</td><td></td></tr><tr><td>146</td><td>790</td><td>246</td><td>395</td><td>Filing a submission after final rejection (37 CFR 1.129(a))</td><td></td></tr><tr><td>149</td><td>790</td><td>249</td><td>395</td><td>For each additional invention to be examined (37 CFR 1.129(b))</td><td></td></tr><tr><td colspan="5">Other fee (specify):</td><td></td></tr><tr><td colspan="5">Other fee (specify):</td><td></td></tr><tr><td colspan="5">SUBTOTAL (3) (\$)</td><td></td></tr><tr><td colspan="5">* Reduced by Basic Filing Fee Paid</td><td></td></tr></tbody></table> |                       | Large Entity Fee Code  | Large Entity Fee (\$) | Small Entity Fee Code | Small Entity Fee (\$) | Fee Description | Fee | 105                       | 130   | 205                | 65 | Surcharge - late filing fee or oath |                       | 127                   | 50                    | 227               | 25  | Surcharge - late provisional filing fee or cover sheet |     | 139 | 130                    | 139              | 130 | Non-English specification |     | 147                               | 2,520 | 147                | 2,520 | For filing a request for reexamination |                          | 112 | 920 | 112                    | 920 | Requesting publication of SIR prior to Examiner action |     | 113 | 1,840 | 113 | 1,840   | Requesting publication of SIR after Examiner action |  | 115 | 110 | 215 | 55 | Extension for reply within first month |  | 116 | 400 | 216 | 200 | Extension for reply within second month |  | 117 | 680 | 217 | 478 | Extension for reply within third month |  | 118 | 1,510 | 218 | 755 | Extension for reply within fourth month |  | 128 | 2,060 | 228 | 1,030 | Extension for reply within fifth month |  | 119 | 310 | 219 | 155 | Notice of Appeal |  | 120 | 310 | 220 | 155 | Filing a brief in support of an appeal |  | 121 | 270 | 221 | 135 | Request for oral hearing |  | 138 | 1,510 | 138 | 1,510 | Petition to institute a public use proceeding |  | 140 | 110 | 240 | 55 | Petition to revive unavoidably abandoned application |  | 141 | 1,320 | 241 | 660 | Petition to revive unintentionally abandoned application |  | 142 | 1,320 | 242 | 660 | Utility issue fee (or reissue) |  | 143 | 450 | 243 | 225 | Design issue fee |  | 144 | 670 | 244 | 335 | Plant issue fee |  | 122 | 130 | 122 | 130 | Petitions to the Commissioner |  | 123 | 50 | 123 | 50 | Petitions related to provisional applications |  | 126 | 240 | 126 | 240 | Submission of Information Disclosure Stmt |  | 581 | 40 | 581 | 40 | Recording each patent assignment per property (times number of properties) |  | 146 | 790 | 246 | 395 | Filing a submission after final rejection (37 CFR 1.129(a)) |  | 149 | 790 | 249 | 395 | For each additional invention to be examined (37 CFR 1.129(b)) |  | Other fee (specify): |  |  |  |  |  | Other fee (specify): |  |  |  |  |  | SUBTOTAL (3) (\$) |  |  |  |  |  | * Reduced by Basic Filing Fee Paid |  |  |  |  |  |
| Large Entity Fee Code  | Large Entity Fee (\$) | Small Entity Fee Code  | Small Entity Fee (\$) | Fee Description  | Fee                   |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 105  | 130                   | 205  | 65                    | Surcharge - late filing fee or oath  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 127  | 50                    | 227  | 25                    | Surcharge - late provisional filing fee or cover sheet                     |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 139  | 130                   | 139  | 130                   | Non-English specification  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 147  | 2,520                 | 147  | 2,520                 | For filing a request for reexamination                                     |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 112  | 920                   | 112  | 920                   | Requesting publication of SIR prior to Examiner action                     |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 113  | 1,840                 | 113  | 1,840                 | Requesting publication of SIR after Examiner action                        |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 115  | 110                   | 215  | 55                    | Extension for reply within first month                                     |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 116  | 400                   | 216  | 200                   | Extension for reply within second month                                    |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 117  | 680                   | 217  | 478                   | Extension for reply within third month                                     |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 118  | 1,510                 | 218  | 755                   | Extension for reply within fourth month                                    |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 128  | 2,060                 | 228  | 1,030                 | Extension for reply within fifth month                                     |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 119  | 310                   | 219  | 155                   | Notice of Appeal   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 120  | 310                   | 220  | 155                   | Filing a brief in support of an appeal                                     |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 121  | 270                   | 221  | 135                   | Request for oral hearing   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 138  | 1,510                 | 138  | 1,510                 | Petition to institute a public use proceeding                              |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 140  | 110                   | 240  | 55                    | Petition to revive unavoidably abandoned application                       |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 141  | 1,320                 | 241  | 660                   | Petition to revive unintentionally abandoned application                   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 142  | 1,320                 | 242  | 660                   | Utility issue fee (or reissue)   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 143  | 450                   | 243  | 225                   | Design issue fee   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 144  | 670                   | 244  | 335                   | Plant issue fee  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 122  | 130                   | 122  | 130                   | Petitions to the Commissioner  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 123  | 50                    | 123  | 50                    | Petitions related to provisional applications                              |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 126  | 240                   | 126  | 240                   | Submission of Information Disclosure Stmt                                  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 581  | 40                    | 581  | 40                    | Recording each patent assignment per property (times number of properties) |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 146  | 790                   | 246  | 395                   | Filing a submission after final rejection (37 CFR 1.129(a))                |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 149  | 790                   | 249  | 395                   | For each additional invention to be examined (37 CFR 1.129(b))             |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| Other fee (specify):   |                       |  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| Other fee (specify):   |                       |  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| SUBTOTAL (3) (\$)  |                       |  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| * Reduced by Basic Filing Fee Paid   |                       |  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| <p>2. <input type="checkbox"/> Payment Enclosed:</p> <p><input type="checkbox"/> Check <input type="checkbox"/> Money Order <input type="checkbox"/> Other</p>   |                       |  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| <p>FEE CALCULATION (fees effective 10/01/97)</p> <p>1. FILING FEE</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Large Entity Fee (\$)</th><th>Small Entity Fee Code</th><th>Small Entity Fee (\$)</th><th>Fee Description</th><th>Fee Paid</th></tr></thead><tbody><tr><td>101</td><td>790</td><td>201</td><td>395</td><td>Utility filing fee</td><td></td></tr><tr><td>106</td><td>330</td><td>206</td><td>165</td><td>Design filing fee</td><td></td></tr><tr><td>107</td><td>540</td><td>207</td><td>270</td><td>Plant filing fee</td><td></td></tr><tr><td>108</td><td>790</td><td>208</td><td>395</td><td>Reissue filing fee</td><td></td></tr><tr><td>114</td><td>150</td><td>214</td><td>75</td><td>Provisional filing fee</td><td></td></tr><tr><td colspan="5">SUBTOTAL (1) (\$)</td><td></td></tr></tbody></table>  |                       | Large Entity Fee Code  | Large Entity Fee (\$) | Small Entity Fee Code  | Small Entity Fee (\$) | Fee Description       | Fee Paid              | 101             | 790 | 201                       | 395   | Utility filing fee |    | 106                                 | 330                   | 206                   | 165                   | Design filing fee |     | 107  | 540 | 207 | 270                    | Plant filing fee |     | 108                       | 790 | 208                               | 395   | Reissue filing fee |       | 114                                    | 150                      | 214 | 75  | Provisional filing fee |     | SUBTOTAL (1) (\$)                                      |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| Large Entity Fee Code  | Large Entity Fee (\$) | Small Entity Fee Code  | Small Entity Fee (\$) | Fee Description  | Fee Paid              |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 101  | 790                   | 201  | 395                   | Utility filing fee   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 106  | 330                   | 206  | 165                   | Design filing fee  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 107  | 540                   | 207  | 270                   | Plant filing fee   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 108  | 790                   | 208  | 395                   | Reissue filing fee   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 114  | 150                   | 214  | 75                    | Provisional filing fee   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| SUBTOTAL (1) (\$)  |                       |  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| <p>2. CLAIMS</p> <table border="1"><thead><tr><th>Total Claims</th><th>Extra</th><th>Fee from below</th><th>Fee Paid</th></tr></thead><tbody><tr><td>Independent Claims</td><td>-20**=</td><td>X</td><td></td></tr><tr><td>Multiple Dependent Claims</td><td>-3**=</td><td>X</td><td></td></tr></tbody></table> <p>** or number previously paid, if greater. For reissues see below</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Large Entity Fee (\$)</th><th>Small Entity Fee Code</th><th>Small Entity Fee (\$)</th><th>Fee Description</th></tr></thead><tbody><tr><td>103</td><td>22</td><td>203</td><td>11</td><td>Claims in excess of 20</td></tr><tr><td>102</td><td>82</td><td>202</td><td>41</td><td>Independent claims in excess of 3</td></tr><tr><td>104</td><td>270</td><td>204</td><td>135</td><td>Multiple dependent claim</td></tr><tr><td>109</td><td>80</td><td>209</td><td>40</td><td>**Reissue independent claims over original patent</td></tr><tr><td>110</td><td>22</td><td>210</td><td>11</td><td>**Reissue claims in excess of 20 and over original patent</td></tr><tr><td colspan="5">SUBTOTAL (2) (\$)</td><td></td></tr></tbody></table> |                       | Total Claims   | Extra                 | Fee from below   | Fee Paid              | Independent Claims    | -20**=                | X               |     | Multiple Dependent Claims | -3**= | X                  |    | Large Entity Fee Code               | Large Entity Fee (\$) | Small Entity Fee Code | Small Entity Fee (\$) | Fee Description   | 103 | 22   | 203 | 11  | Claims in excess of 20 | 102              | 82  | 202                       | 41  | Independent claims in excess of 3 | 104   | 270                | 204   | 135                                    | Multiple dependent claim | 109 | 80  | 209                    | 40  | **Reissue independent claims over original patent      | 110 | 22  | 210   | 11  | **Reissue claims in excess of 20 and over original patent | SUBTOTAL (2) (\$)                                   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| Total Claims   | Extra                 | Fee from below   | Fee Paid              |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| Independent Claims   | -20**=                | X  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| Multiple Dependent Claims  | -3**=                 | X  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| Large Entity Fee Code  | Large Entity Fee (\$) | Small Entity Fee Code  | Small Entity Fee (\$) | Fee Description  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 103  | 22                    | 203  | 11                    | Claims in excess of 20   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 102  | 82                    | 202  | 41                    | Independent claims in excess of 3  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 104  | 270                   | 204  | 135                   | Multiple dependent claim   |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 109  | 80                    | 209  | 40                    | **Reissue independent claims over original patent                          |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| 110  | 22                    | 210  | 11                    | **Reissue claims in excess of 20 and over original patent                  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |
| SUBTOTAL (2) (\$)  |                       |  |                       |  |                       |                       |                       |                 |     |                           |       |                    |    |                                     |                       |                       |                       |                   |     |  |     |     |                        |                  |     |                           |     |                                   |       |                    |       |  |                          |     |     |                        |     |  |     |     |       |     |   |   |  |     |     |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |     |       |     |     |   |  |     |       |     |       |  |  |     |     |     |     |                  |  |     |     |     |     |  |  |     |     |     |     |                          |  |     |       |     |       |   |  |     |     |     |    |  |  |     |       |     |     |  |  |     |       |     |     |                                |  |     |     |     |     |                  |  |     |     |     |     |                 |  |     |     |     |     |                               |  |     |    |     |    |   |  |     |     |     |     |   |  |     |    |     |    |  |  |     |     |     |     |   |  |     |     |     |     |  |  |                      |  |  |  |  |  |                      |  |  |  |  |  |                   |  |  |  |  |  |                                    |  |  |  |  |  |

| SUBMITTED BY          |                   | Complete (if applicable) |        |
|-----------------------|-------------------|--------------------------|--------|
| Typed or Printed Name | Bennett J. Berson | Reg. Number              | 37,094 |
| Signature             |                   | Deposit Account User ID  |        |
| Date                  | October 21, 1998  |                          |        |

QBMA0173049

|   |   |                                   |  |
|---|---|-----------------------------------|--|
| <h2 style="margin: 0;">Interview Summary</h2> | Application No.<br><b>09/037,890</b>    | Applicant(s)<br><b>Cook et al</b> |  |
|   | Examiner<br><b>F. Pierre VanderVegt</b> | Group Art Unit<br><b>1844</b>     |  |

All participants (applicant, applicant's representative, PTO personnel):

(1) F. Pierre VanderVegt (3) \_\_\_\_\_

(2) Bennett Berson (4) \_\_\_\_\_

Date of Interview Dec 4, 1998

Type: ☒ Telephonic ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description:

\_\_\_\_\_

Agreement ☒ was reached. ☐ was not reached.

Claim(s) discussed: 1, 7, 8, and 10-13

Identification of prior art discussed:  
None in particular.

Description of the general nature of what was agreed to if an agreement was reached, or any other comments:  
Applicant agreed to the Examiner's amendment for the purpose of clearly define the claimed invention in terms which are consistent with the instant specification.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

1. ☒ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a response to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

2. ☒ Since the Examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the interview unless box 1 above is also checked.

Examiner Note: You must sign and stamp this form unless it is an attachment to a signed Office action.

|                               |                                  |                            |
|-------------------------------|----------------------------------|----------------------------|
| <b>Notice of Allowability</b> | Application No.<br>09/037,690    | Applicant(s)<br>Cook et al |
|                               | Examiner<br>F. Pierre VanderVegt | Group Art Unit<br>1644     |

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

☒ This communication is responsive to paper filed 10/9/98.

☒ The allowed claim(s) ~~is/are~~ 1, 2, 6, 8, 9, 12, and 13.

☐ The drawings filed on \_\_\_\_\_ are acceptable.

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☐ Applicant MUST submit NEW FORMAL DRAWINGS

☐ because the originally filed drawings were declared by applicant to be informal.

☐ including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. \_\_\_\_\_.

☐ including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.

☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

**Attachment(s)**

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

☒ Interview Summary, PTO-413

☒ Examiner's Amendment/Comment

☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

☒ Examiner's Statement of Reasons for Allowance

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**DETAILED ACTION**

This application is a continuation of application S.N. 08/684,785.

Claims 3-5 have been canceled and new claim 11 has been added. Claims 1 and 6-11 are currently pending in this application.

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**EXAMINER'S AMENDMENT**

1. An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

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Authorization for this Examiner's amendment was given in a telephone interview with Bennett Berson on November 24, 1998.

2. The application has been amended as follows:

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**IN THE CLAIMS:**

Claim 11 has been canceled without prejudice.

In claim 1, line 11, the recitation "indigenous" has been replaced by --endogenous--.

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In claim 8, line 4, the recitation "indigenous" has been replaced by --endogenous--.

Claims 7 and 10 have been canceled and replaced by the following new claims:

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12. A method to improve the growth of an animal or the efficiency of an animal to convert feed into desired body tissue, said method comprising feeding an animal an effective amount of animal feed particles comprising an inner core of nutrients and having an outer surface, and a layer consisting essentially of unencapsulated antibodies and conjugated linoleic acid on the outer surface of the inner core,

B,

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B<sub>1</sub>  
cont.  
5 said antibodies being antibodies that can passively immunize the animal against the adverse effects of an endogenous gut peptide which could reduce the animal's ability to grow or to efficiently convert its feed into desirable body tissue, wherein the method achieves superior growth or feed conversion than a second method wherein the antibody is fed to the animal in an unpelleted form.

7  
13. A particulate animal feed comprising an inner core of nutrients, the core having an outer surface, and a layer consisting essentially of conjugated linoleic acid and at least one unencapsulated antibody to an endogenous gut peptide on the outer surface of the inner core.

10  
15 3. Claims 1 and 6-11 do not have the benefit under 35 USC § 120 of the filing date of application S.N. 08/684,785. For example, "consisting essentially of unencapsulated antibodies on the outer surface" (claim 1), "consisting essentially of at least one unencapsulated antibody to an endogenous gut peptide" (claim 8) and "where in the coating step the antibody is not encapsulated in a fat" (claim 11) were not disclosed in the priority application. The priority application discloses only the encapsulating the antibodies of the coating in a fat. Thus, claims 1 and 6-11, which recite features not disclosed in the priority application are entitled only to the filing date of the instant application, which is March 10, 1998. See MPEP 201.22.

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**REASONS FOR ALLOWANCE**

4. The following is an Examiner's statement of reasons for allowance:

25 Claims 1 and 8 have been amended supra in a manner which is consistent with the instant specification. Claims 7 and 10 have been replaced by new claims 12 and 13 in order to be consistent with the subject matter of claims 1 and 8. The Examiner's amendment was agreed to by Applicant in order to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In view of Applicant's amendment filed October 9, 1998 and the Examiner's amendment all outstanding grounds of rejection are withdrawn. The double

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patenting rejections over U.S. Patent No. 5,726,873 (A, of record) were overcome by the Applicant's amendment because the invention of the '873 patent does not encompass feed particles with an anti-gut-peptide-antibody-comprising outer layer which is not fat encapsulated, a feature which is integral to the instant invention. The prior art of record does not teach or suggest the claimed invention.

Any comments considered necessary by Applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Conclusion*

5. Papers related to this application may be submitted to Technology Center 1600, Group 1640 by facsimile transmission. Papers should be faxed to Group 1640 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The fax phone number for official documents to be entered into the record for Art Unit 1644 is (703)305-3014.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to F. Pierre VanderVegt, whose telephone number is (703)305-6997. The Examiner can normally be reached Monday through Friday from 8:00 am to 4:30 pm ET. A message may be left on the Examiner's voice mail service. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Ms. Christina Chan can be reached at (703)308-3973. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1600 receptionist, whose telephone number is (703)308-0196.

December 4, 1998  
F. Pierre VanderVegt, Ph.D.  
Patent Examiner  
Art Unit 1644

*David A. Saunders*  
DAVID SAUNDERS  
PRIMARY EXAMINER  
ART UNIT 1644

B



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

HM11/1207

BENNETT J. GERSON  
QUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

| APPLICATION NO.       | FILING DATE | TOTAL CLAIMS                      | EXAMINER AND GROUP ART. UNIT | DATE MAILED   |
|-----------------------|-------------|-----------------------------------|------------------------------|---------------|
| 09/037,690            | 03/10/98    | 007                               | VANDER VEGT, P               | 1644 12/07/98 |
| First Named Applicant | COOK,       | 35 USC 154(b) term ext. = 0 days. |                              |               |

TITLE OF INVENTION METHOD OF IMPROOVING THE GROWTH OR THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN

| ATTY'S DOCKET NO. | CLASS-SUBCLASS | BATCH NO.   | APPL. TYPE  | SMALL ENTITY | FEE DUE   | DATE DUE |
|-------------------|----------------|-------------|-------------|--------------|-----------|----------|
| 1                 | 960296.94011   | 424-130.100 | M33 UTILITY | NO           | \$1210.00 | 03/08/99 |

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT.  
PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS  
APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

I. Review the SMALL ENTITY status shown above.  
If the SMALL ENTITY is shown as YES, verify your  
current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the  
FEE DUE shown above and notify the Patent and  
Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown  
above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with,  
payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your  
ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal  
should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part  
B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.  
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of  
maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance  
fees when due.**

PATENT AND TRADEMARK OFFICE COPY

PTOL-85 (REV. 10-96) Approved for use through 06/30/99. (0651-0033)

## PART B—ISSUE FEE TRANSMITTAL

Complete and mail this form, together with

licable fees, to:

Box ISSUE FEE  
Assistant Commissioner for Patents  
Washington, D.C. 20231

B \$

**MAILING INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

BENNETT J. BERSON  
QUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

HM11/1207

Note: The certificate of mailing below can only be used for domestic mailings of this Issue Fee Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

## Certificate of Mailing

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

Bennett J. Berson (Depositor's name)

(Signature)

February 26, 1999 (Date)

| APPLICATION NO.  | FILING DATE | TOTAL CLAIMS | EXAMINER AND GROUP ART UNIT | DATE MAILED   |
|--|-------------|--------------|-----------------------------|---------------|
| 09/037,690   | 03/10/98    | 007          | VANDER VEGT, F              | 1644 12/07/98 |
| First Named Applicant: COOK, 35 USC 154(b) term ext. = 0 Days. |             |              |                             |               |

TITLE OF INVENTION: METHOD OF IMPROOVING THE GROWTH OR THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN

| ATTYS DOCKET NO. | CLASS-SUBCLASS | BATCH NO. | APPLN. TYPE | SMALL ENTITY | FEE DUE   | DATE DUE |
|------------------|----------------|-----------|-------------|--------------|-----------|----------|
| 1 960296.94011   | 424-130.100    | M33       | UTILITY     | NO           | \$1210.00 | 03/08/99 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" indication form PTO/SB/47) attached.

2. For printing on the patent front page, list:  
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. Quarles &amp; Brady LLP

2. \_\_\_\_\_

3. \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type).  
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Wisconsin Alumni Research Foundation

(B) RESIDENCE: (CITY &amp; STATE OR COUNTRY)

Madison, WI US

Please check the appropriate assignee category indicated below (will not be printed on the patent).

☐ Individual ☒ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

☐ Issue Fee☐ Advance Order - # of Copies \_\_\_\_\_

4b. The following fees or deficiency in these fees should be charged to:

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(ENCLOSE AN EXTRA COPY OF THIS FORM)☒ Issue Fee☐ Advance Order - # of Copies 10

The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the issue fee to the application identified above.

(Authorized Signature)

(Date)

2/26/99

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**Burden Hour Statement:** This form is estimated to take 0.2 hours to complete. Time will vary depending on the needs of the individual case. Any comments on the amount of time required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND FEES AND THIS FORM TO: Box Issue Fee, Assistant Commissioner for Patents, Washington D.C. 20231

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03/04/1999 RTSEGAY1 00000138 170055 09037690

01 FC:142

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Communications Section

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Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

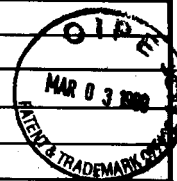
## FEE TRANSMITTAL

Patent fees are subject to annual revision on October 1.  
These are the fees effective November 10, 1998.  
Small Entity payments must be supported by a small entity statement  
otherwise large entity fees must be paid. See Forms PTO/SB/08-12

TOTAL AMOUNT OF PAYMENT \$ 1240.00

## Complete if Known

|                        |               |
|------------------------|---------------|
| Application Number     | 09/037,690    |
| Filing Date            | 03/10/98      |
| First Named Inventor   | Mark E. Cook  |
| Group Art Unit         | 1644          |
| Examiner Name          | F. VanderVegt |
| Attorney Docket Number | 960296.95297  |



## METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 17-0055

Deposit Account Name: Quarles & Brady LLP

☐ Charge Any Additional Fees Required Under 37 CFR 1.16 and 1.17 ☒ Charge the Issue Fee Set in 37 CFR 1.31 at the Meeting of the Notice of Allowance, 37 CFR 1.31(b)

2. ☐ Payment Enclosed:

☐ Check ☐ Money Order ☐ Other

## FEE CALCULATION (fees effective 11/10/98)

## 1. FILING FEE

| Large Entity Fee Code | Small Entity Fee Code | Fee Description        | Fee Paid |
|-----------------------|-----------------------|------------------------|----------|
| 101 760               | 201 380               | Utility filing fee     |          |
| 106 310               | 206 155               | Design filing fee      |          |
| 107 480               | 207 240               | Plant filing fee       |          |
| 108 760               | 208 380               | Reissue filing fee     |          |
| 114 150               | 214 75                | Provisional filing fee |          |

SUBTOTAL (1) (\$)

## 2. CLAIMS

| Total Claims              | Extra | Fee from below | Fee Paid |
|---------------------------|-------|----------------|----------|
| Independent Claims        | 20**= | X              |          |
| Multiple Dependent Claims | 3**=  | X              |          |

\*\* or number previously paid, if greater, For reissues see below

| Large Entity Fee Code | Small Entity Fee Code | Fee Description   |
|-----------------------|-----------------------|---|
| 103 18                | 203 09                | Claims in excess of 20                                    |
| 102 78                | 202 39                | Independent claims in excess of 3                         |
| 104 260               | 204 130               | Multiple dependent claim                                  |
| 109 78                | 209 39                | **Reissue independent claims over original patent         |
| 110 18                | 210 09                | **Reissue claims in excess of 20 and over original patent |

SUBTOTAL (2) (\$)

## FEE CALCULATION (continued)

## 3. ADDITIONAL FEES

| Large Entity Fee Code | Small Entity Fee Code | Fee Description  | Fee  |
|-----------------------|-----------------------|--|------|
| 105 130               | 205 65                | Surcharge - late filing fee or oath  |      |
| 127 50                | 227 25                | Surcharge - late provisional filing fee or cover sheet                     |      |
| 139 130               | 139 130               | Non-English specification  |      |
| 147 2,520             | 147 2,520             | For filing a request for reexamination                                     |      |
| 112 '920              | 112 '920              | Requesting publication of SIR prior to Examiner action                     |      |
| 113 '1,840            | 113 '1,840            | Requesting publication of SIR after Examiner action                        |      |
| 115 110               | 215 55                | Extension for reply within first month                                     |      |
| 116 380               | 216 190               | Extension for reply within second month                                    |      |
| 117 870               | 217 435               | Extension for reply within third month                                     |      |
| 118 1,360             | 218 680               | Extension for reply within fourth month                                    |      |
| 128 1,850             | 228 925               | Extension for reply within fifth month                                     |      |
| 119 300               | 219 150               | Notice of Appeal   |      |
| 120 300               | 220 150               | Filing a brief in support of an appeal                                     |      |
| 121 260               | 221 130               | Request for oral hearing   |      |
| 138 1,510             | 138 1,510             | Petition to institute a public use proceeding                              |      |
| 140 110               | 240 55                | Petition to revive unavoidably abandoned application                       |      |
| 141 1,210             | 241 605               | Petition to revive unintentionally abandoned application                   |      |
| 142 1,210             | 242 605               | Utility issue fee (or reissue)   | 1210 |
| 143 430               | 243 215               | Design issue fee   |      |
| 144 580               | 244 290               | Plant issue fee  |      |
| 122 130               | 122 130               | Petitions to the Commissioner  |      |
| 123 50                | 123 50                | Petitions related to provisional applications                              |      |
| 126 240               | 126 240               | Submission of Information Disclosure Stmt                                  |      |
| 581 40                | 581 40                | Recording each patent assignment per property (times number of properties) |      |
| 146 760               | 246 380               | Filing a submission after final rejection (37 CFR 1.129(a))                |      |
| 149 760               | 249 380               | For each additional invention to be examined (37 CFR 1.129(b))             |      |

Other fee (specify) Advance order 30

Other fee (specify)

SUBTOTAL (3) (\$1240.00)

Reduced by Basic Filing Fee Paid

## SUBMITTED BY

Typed or Printed Name: Bennett J. Berson

Signature:

Date: February 26, 1999

## Complete (if applicable)

Reg. Number: 37,094

Deposit Account User ID

DEC 21 1998

RECEIPT

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date set forth below as First Class Mail in an envelope addressed to:  
Assistant Commissioner for Patents, Washington, D.C. 20231.

Date of Signature and Deposit: December 15, 1998

*B. J. Berson*

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark E. Cook  
Daria L. Jerome

Date: December 15, 1998

Serial No.: 09/037,690

Group Art Unit: 1644

Filed: 03/10/98

Examiner: F. VanderVegt

For: METHOD OF IMPROVING THE  
GROWTH OR THE EFFICIENCY  
OF FEED CONVERSION OF AN  
ANIMAL AND COMPOSITIONS  
FOR USE THEREIN

File No. 960296,94011  
(now 960296,95297)

JAN 20 1999

RECEIVED  
COMM. FOR PAT. & TRADEMARKS

REQUEST FOR CORRECTED FILING RECEIPT

Assistant Commissioner for Patents  
Application Processing Division  
Customers Correction Branch  
Washington DC 20231

Dear Sir:

An error is noted in the Corrected Filing Receipt received in connection with the above-noted patent application.

The applicants had asked that the attorney docket number be updated so that the last five digits are 95297.

Unfortunately, the last five digits were changed to 94297.

Please correct the attorney docket number so that it reads 960296.95297 as noted on the accompanying copy of the Corrected Filing Receipt.

Respectfully submitted,

*B. J. Berson*

Bennett J. Berson  
Reg. No. 37,094  
Attorney for Applicants  
QUARLES & BRADY  
P.O. Box 2113  
Madison, WI 53701-2113  
(608) 251-5000

QBMAD\176964

RECEIVED  
TECH CENTER 1800/2900  
89 JAN 15 AM 10:36  
GROUP 180

PTO-103X  
(Rev. 7-93)

FILING RECEIPT  
CORRECTED



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
ASSISTANT SECRETARY AND COMMISSIONER  
OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

| APPLICATION NUMBER | FILING DATE | GRP ART UNIT | FIL FEE REC'D | ATTORNEY DOCKET NO. | DRWGS | TOT CL | IND CL |
|--------------------|-------------|--------------|---------------|---------------------|-------|--------|--------|
| 09/037,690         | 03/10/98    | 1644         | \$1,002.00    | 960296.9/297        | 0     | 10     | 4      |

BENNETT J. BERSON  
QUARLES & BRADY  
PO BOX 2113  
MADISON WI 53701-2113

Receipt is acknowledged of this patent application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Application Processing Division's Customer Correction Branch within 10 days of receipt. Please provide a copy of the Filing Receipt with the changes noted thereon.

Applicant(s)

MARK E. COOK, MADISON, WI; DARIA L. JEROME, FRAZEE, MN.

CONTINUING DATA AS CLAIMED BY APPLICANT-

THIS APPLN IS A CIP OF 08/684,785 07/22/96 PAT 5,725,873

FOREIGN FILING LICENSE GRANTED 03/27/98

TITLE

METHOD OF IMPROVING THE GROWTH OR THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN

PRELIMINARY CLASS: 424

TECH. DIV. 1200  
09 JAN 15 AM 10:36  
GROUP 180

DATA ENTRY BY: WILSON, PAMELLA

TEAM: 12 DATE: 12/07/98

(see reverse)

**FEE TRANSMITTAL**

Patent fees are subject to annual revision on October 1.  
These are the fees effective November 19, 1998.  
Small Entity payments must be supported by a small entity statement  
otherwise large entity fees must be paid. See Forms PTO/SB/09-12

**Complete if Known**

TOTAL AMOUNT OF PAYMENT

\$

Application Number

09/037,690

Filing Date

03/10/98

First Named Inventor

Mark E. Cook

Group Art Unit

1644

Examiner Name

F. VanderVegt

Attorney Docket Number

960296.95297

**METHOD OF PAYMENT (check one)**

- 1.
- ☒
- The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit  
Account  
Number

17-0055

Deposit  
Account  
Name

Quarles &amp; Brady LLP

- ☒
- Charge Any Additional
- 
- Fees Required Under 37
- 
- CFR 1.16 and 1.17
- ☐
- Charge the Issue Fee Set in 37 CFR
- 
- 1.18 at the time of the Notice of
- 
- Allowance, 37 CFR 1.311(b)

- 2.
- ☐
- Payment Enclosed:

☐

Check

☐Money  
Order☐

Other

**FEE CALCULATION (fees effective 11/10/98)****1. FILING FEE**

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee Description        | Fee Paid |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------|----------|
| 101                         | 760                         | 201                         | 380                         | Utility filing fee     |          |
| 106                         | 310                         | 206                         | 155                         | Design filing fee      |          |
| 107                         | 480                         | 207                         | 240                         | Plant filing fee       |          |
| 108                         | 760                         | 208                         | 380                         | Reissue filing fee     |          |
| 114                         | 150                         | 214                         | 75                          | Provisional filing fee |          |

SUBTOTAL (1) (\$)

**2. CLAIMS**

|                           | Extra  | Fee from<br>below | Fee Paid |
|---------------------------|--------|-------------------|----------|
| Total Claims              | -20**= | X                 |          |
| Independent<br>Claims     | -3**=  | X                 |          |
| Multiple Dependent Claims |        |                   |          |

\*\* or number previously paid, if greater. For reissues see below

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee Description  |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|
| 103                         | 18                          | 203                         | 09                          | Claims in excess of 20                                       |
| 102                         | 78                          | 202                         | 39                          | Independent claims in excess of 3                            |
| 104                         | 260                         | 204                         | 130                         | Multiple dependent claim                                     |
| 109                         | 78                          | 209                         | 39                          | **Reissue independent claims<br>over original patent         |
| 110                         | 18                          | 210                         | 09                          | **Reissue claims in excess of 20<br>and over original patent |

SUBTOTAL (2) (\$)

**FEE CALCULATION (continued)****3. ADDITIONAL FEES.**

| Large Entity<br>Fee<br>Code | Large Entity<br>Fee<br>(\$) | Small Entity<br>Fee<br>Code | Small Entity<br>Fee<br>(\$) | Fee   |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---|
| 105                         | 130                         | 205                         | 65                          | Surcharge - late filing fee or oath   |
| 127                         | 50                          | 227                         | 25                          | Surcharge - late provisional filing fee or<br>cover sheet                     |
| 139                         | 130                         | 139                         | 130                         | Non-English specification   |
| 147                         | 2,520                       | 147                         | 2,520                       | For filing a request for reexamination  |
| 112                         | '920                        | 112                         | '920                        | Requesting publication of SIR prior to<br>Examiner action                     |
| 113                         | '1,840                      | 113                         | '1,840                      | Requesting publication of SIR after Examiner<br>action                        |
| 116                         | 110                         | 216                         | 55                          | Extension for reply within first month  |
| 116                         | 380                         | 216                         | 190                         | Extension for reply within second month                                       |
| 117                         | 870                         | 217                         | 435                         | Extension for reply within third month  |
| 118                         | 1,360                       | 218                         | 680                         | Extension for reply within fourth month                                       |
| 128                         | 1,850                       | 228                         | 925                         | Extension for reply within fifth month  |
| 119                         | 300                         | 219                         | 150                         | Notice of Appeal  |
| 120                         | 300                         | 220                         | 150                         | Filing a brief in support of an appeal  |
| 121                         | 260                         | 221                         | 130                         | Request for oral hearing  |
| 138                         | 1,510                       | 138                         | 1,510                       | Petition to institute a public use proceeding                                 |
| 140                         | 110                         | 240                         | 55                          | Petition to revive unavoiably abandoned<br>application                        |
| 141                         | 1,210                       | 241                         | 605                         | Petition to revive unintentionally abandoned<br>application                   |
| 142                         | 1,210                       | 242                         | 605                         | Utility issue fee (or reissue)  |
| 143                         | 430                         | 243                         | 215                         | Design issue fee  |
| 144                         | 580                         | 244                         | 290                         | Plant issue fee   |
| 122                         | 130                         | 122                         | 130                         | Petitions to the Commissioner   |
| 123                         | 50                          | 123                         | 50                          | Petitions related to provisional applications                                 |
| 126                         | 240                         | 126                         | 240                         | Submission of Information Disclosure Stmt                                     |
| 581                         | 40                          | 581                         | 40                          | Recording each patent assignment per<br>property (times number of properties) |
| 146                         | 760                         | 246                         | 380                         | Filing a submission after final rejection<br>(37 CFR 1.128(a))                |
| 149                         | 760                         | 249                         | 380                         | For each additional invention to be examined<br>(37 CFR 1.128(b))             |

Other fee (specify) \_\_\_\_\_

Other fee (specify) \_\_\_\_\_


SUBTOTAL (3) (\$)

\* Reduced by Basic Filing Fee Paid

**SUBMITTED BY**Typed or  
Printed Name

Bennett J. Berson

Signature



Date

December 15, 1998

**Complete (if applicable)**

Reg. Number

37,094

Deposit Account  
User ID

QBMA01176985





I hereby certify that this correspondence is being deposited with the United States Postal Service on the date set forth below as First Class Mail in an envelope addressed to: Commissioner for Patents, P O Box 1450, Alexandria, VA 22313-1450.

Date of Signature and Deposit: November 3, 2003

Bennett J. Bersen  
Bennett J. Bersen

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark E. Cook  
Daria L. Jerome

Date: November 3, 2003

Patent No.: 5,919,451

Issued: July 6, 1999

Serial No.: 09/037,690

Group Art Unit: 1644

Filed: March 10, 1998

Examiner: F. Pierre VanderVegt

For: METHOD OF IMPROVING THE GROWTH  
OR THE EFFICIENCY OF FEED CONVERSION  
OF AN ANIMAL AND COMPOSITIONS FOR  
USE THEREIN

Docket No.: 960296.95297

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 C.F.R. §1.322(a)

Commissioner For Patents  
P O Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Applicants hereby request that the attached Certificate of Correction be issued in conjunction with the above-noted patent.

A Certificate of Correction requesting inclusion of federal funding is enclosed.

A fee in the amount of \$100.00 is believed due in connection with this Certificate.

Please charge the fee to deposit account number 17-0055. Should the Office have any questions, please contact the undersigned directly.

Respectfully submitted,

Bennett J. Bersen  
Bennett J. Bersen

Reg. No. 37,094

Attorney for the Applicants

QUARLES & BRADY LLP

P.O. Box 2113

Madison, WI 53701-2113

TEL 608/251-5000  
FAX 608/251-9166

QBMA0\366073.1

5919451

170055

00000107

11/07/2003

11/07/2003

100.00 DA

01 FC:1811

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

CR

NOV 13 2003

PATENT NO : 5,919,451

DATED : July 6, 1999

INVENTOR(S) : Mark E. Cook/Daria L. Jerome

It is certified that error appears in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

~~In the Specification:~~Col. 1,  
Page 1

line 9, please delete the entire paragraph and insert therefor the following:

--This invention was made with United States government support awarded by the following  
agencies:

USDA 96-CRHR-0-6055

The United States has certain rights in this invention.--

MAILING ADDRESS OF SENDER: Bennett J Berson  
Quarles & Brady LLP  
P O Box 2113  
Madison, WI 53701-2113

PATENT NO. 5,919,451

No. of additional copies



Burden Hour Statement: This form is estimated to take 1.0 hour to complete. Time will vary depending upon the needs of the individual case. Any comment on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

QBMAD\366076



# 12  
S.S. CoFC

Express Mail No.

Approved for use through 07/31/2008. OMB 0651-0032  
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE  
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 100.00

## Complete if Known

|                      |                      |            |
|----------------------|----------------------|------------|
| Application Number   | 09/037,690           | 5,919,451  |
| Filing Date          | 03/10/1998           | 07/06/1999 |
| First Named Inventor | Mark E. Cook         |            |
| Examiner Name        | F. Pierre VanderVeet |            |
| Art Unit             | 1644                 |            |
| Attorney Docket No.  | 960296.95297         |            |

**METHOD OF PAYMENT** (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account Number: 17-0055

Deposit Account Name: Quarles & Brady LLP

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

**FEE CALCULATION**

| 1. BASIC FILING FEE        |                            |
|----------------------------|----------------------------|
| Large Entity Fee Code (\$) | Small Entity Fee Code (\$) |
| 1001 770                   | 2001 385                   |
| 1002 340                   | 2002 170                   |
| 1003 530                   | 2003 265                   |
| 1004 770                   | 2004 385                   |
| 1005 180                   | 2005 80                    |
| SUBTOTAL (1) (\$ 0.00      |                            |

## 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

|                    | Extra Claims         | Fee from below       | Fee Paid             |
|--------------------|----------------------|----------------------|----------------------|
| Total Claims       | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Independent Claims | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Multiple Dependent | <input type="text"/> | <input type="text"/> | <input type="text"/> |

| Large Entity Fee Code (\$) | Small Entity Fee Code (\$) | Fee Description  |
|----------------------------|----------------------------|--|
| 1202 18                    | 2202 9                     | Claims in excess of 20                                     |
| 1201 86                    | 2201 43                    | Independent claims in excess of 3                          |
| 1203 290                   | 2203 145                   | Multiple dependent claim, if not paid                      |
| 1204 86                    | 2204 43                    | ** Reissue independent claims over original patent         |
| 1205 18                    | 2205 9                     | ** Reissue claims in excess of 20 and over original patent |
| SUBTOTAL (2)               |                            | (\$)<br>0.00   |

\*\*or number previously paid, if greater; For Reissues, see above

## 3. ADDITIONAL FEES

Large Entity - Small Entity

| Fee Code (\$)                                      | Fee Code (\$) | Fee Description  | Fee Paid |
|--|---------------|--|----------|
| 1051 130   | 2051 65       | Surcharge - late filing fee of path  |          |
| 1052 50  | 2052 25       | Surcharge - late provisional filing fee or cover sheet                     |          |
| 1053 130   | 2053 130      | Non-English specification  |          |
| 1812 2,520   | 1812 2,520    | For filing a request for <i>ex parte</i> reexamination                     |          |
| 1804 920*  | 1804 920*     | Requesting publication of SIR prior to Examiner action                     |          |
| 1805 1,840*  | 1805 1,840*   | Requesting publication of SIR after Examiner action                        |          |
| 1251 110   | 2251 55       | Extension for reply within first month                                     |          |
| 1252 420   | 2252 210      | Extension for reply within second month                                    |          |
| 1253 950   | 2253 475      | Extension for reply within third month                                     |          |
| 1254 1,480   | 2254 740      | Extension for reply within fourth month                                    |          |
| 1255 2,010   | 2255 1,005    | Extension for reply within fifth month                                     |          |
| 1401 330   | 2401 165      | Notice of Appeal   |          |
| 1402 330   | 2402 165      | Filing a brief in support of an appeal                                     |          |
| 1403 290   | 2403 145      | Request for oral hearing   |          |
| 1451 1,510   | 1451 1,510    | Petition to institute a public use proceeding                              |          |
| 1452 110   | 2452 55       | Petition to revive - unavoidable   |          |
| 1453 1,330   | 2453 665      | Petition to revive - unintentional   |          |
| 1501 1,330   | 2501 665      | Utility issue fee (or reissue)   |          |
| 1502 480   | 2502 240      | Design issue fee   |          |
| 1803 840   | 2803 320      | Plant issue fee  |          |
| 1460 130   | 1460 130      | Petitions to the Commissioner  |          |
| 1807 50  | 1807 50       | Processing fee under 37 CFR 1.17(q)  |          |
| 1806 180   | 1806 180      | Submission of Information Disclosure Stmt                                  |          |
| 8021 40  | 8021 40       | Recording each patent assignment per property (times number of properties) |          |
| 1809 770   | 2809 385      | Filing a submission after final rejection (37 CFR 1.129(a))                |          |
| 1810 770   | 2810 385      | For each additional invention to be examined (37 CFR 1.129(b))             |          |
| 1801 770   | 2801 385      | Request for Continued Examination (RCE)                                    |          |
| 1802 900   | 1802 900      | Request for expedited examination of a design application                  |          |
| Other fee (specify) 1811 Certificate of Correction |               |  | 100      |
| *Reduced by Basic Filing Fee Paid                  |               |  |          |
| SUBTOTAL (3) (\$ 100.00                            |               |  |          |

**SUBMITTED BY**

Name (Print/Type) Bennett J. Benson

Registration No. (Attorney/Agent) 37,094

Telephone 608/251-5000

Signature [Signature]

Date November 3, 2003

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

QBMAD1366077

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

NOV 13 2003

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION

PATENT NO. : 5,919,451  
DATED : July 6, 1999  
INVENTOR(S) : Mark E. Cook and Daria L. Jerome

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1.

Line 9, please delete the entire paragraph and insert therefor the following:

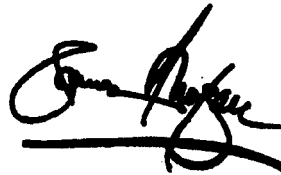
-- This invention was made with United States government support awarded by the following agencies:

USDA 96-CRHR-0-6055

The United States has certain rights in this invention. --

Signed and Sealed this

Ninth Day of December, 2003

A handwritten signature in black ink, appearing to read "James E. Rogan", with a horizontal line drawn underneath it.

JAMES E. ROGAN  
*Director of the United States Patent and Trademark Office*

|                                    |        |                         |  |
|------------------------------------|--------|-------------------------|--|
| PATENT NUMBER                      |        | ORIGINAL CLASSIFICATION |  |
|                                    |        | CLASS                   | SUBCLASS   |
|                                    |        | 424                     | 130.1  |
| APPLICATION SERIAL NUMBER          |        | CROSS REFERENCE(S)      |  |
| 09/037,690                         |        |                         |  |
| APPLICANT'S NAME (PLEASE PRINT)    |        | CLASS                   | SUBCLASS<br>(ONE SUBCLASS PER BLOCK)                 |
| Cook et al                         |        | 424                     | 157.1 158.1 442                                      |
|                                    |        | 106                     | 124.1  |
|                                    |        | 426                     | 89 140 657   |
| IF REISSUE, ORIGINAL PATENT NUMBER |        | 530                     | 388.2  |
|                                    |        |                         |  |
| INTERNATIONAL CLASSIFICATION       |        |                         |  |
| A 6 1 K                            | 39/395 |                         |  |
| A 2 3 J                            | 3/12   |                         |  |
| A 2 3 J                            | 1/06   |                         |  |
| A 2 3 K                            | 1/16   |                         |  |
|                                    |        | GROUP<br>ART UNIT       | ASSISTANT EXAMINER (PLEASE STAMP OR PRINT FULL NAME) |
|                                    |        | 1644                    | F. Pierre VanderVegt                                 |
|                                    |        |                         | PRIMARY EXAMINER (PLEASE STAMP OR PRINT FULL NAME)   |
|                                    |        |                         | David A. Saunders <i>das</i>                         |

PTO 270  
(REV. 5-91)

ISSUE CLASSIFICATION SLIP

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

17810

## PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 1997

Application or Docket Number

091 037690

## CLAIMS AS FILED - PART I

(Column 1)

(Column 2)

| FOR                              | NUMBER FILED  | NUMBER EXTRA |
|----------------------------------|---------------|--------------|
| BASIC FEE                        |               |              |
| TOTAL CLAIMS                     | 10 minus 20 = | * 0          |
| INDEPENDENT CLAIMS               | 4 minus 3 =   | * 1          |
| MULTIPLE DEPENDENT CLAIM PRESENT |               |              |

\* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY  
TYPE ☐

OR

OTHER THAN  
SMALL ENTITY

| RATE   | FEE    |    | RATE   | FEE    |
|--------|--------|----|--------|--------|
|        | 395.00 | OR |        | 790.00 |
| x\$11= |        | OR | x\$22= |        |
| x41=   |        | OR | x82=   | 82.    |
| +135=  |        | OR | +270=  |        |
| TOTAL  |        | OR | TOTAL  | 872.   |

## CLAIMS AS AMENDED - PART II

(Column 1)

(Column 2)

(Column 3)

| AMENDMENT A                                    | CLAIMS<br>REMAINING<br>AFTER<br>AMENDMENT |       | HIGHEST<br>NUMBER<br>PREVIOUSLY<br>PAID FOR | PRESENT<br>EXTRA |
|--|---|-------|---|------------------|
| Total  | *   | Minus | **  | =                |
| Independent                                    | *   | Minus | ***   | =                |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM |   |       |   |                  |

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

| RATE                | ADDI-<br>TIONAL<br>FEE |    | RATE                | ADDI-<br>TIONAL<br>FEE |
|---------------------|------------------------|----|---------------------|------------------------|
| x\$11=              |                        | OR | x\$22=              |                        |
| x41=                |                        | OR | x82=                |                        |
| +135=               |                        | OR | +270=               |                        |
| TOTAL<br>ADDIT. FEE |                        | OR | TOTAL<br>ADDIT. FEE |                        |

(Column 1)

(Column 2)

(Column 3)

| AMENDMENT B                                    | CLAIMS<br>REMAINING<br>AFTER<br>AMENDMENT |       | HIGHEST<br>NUMBER<br>PREVIOUSLY<br>PAID FOR | PRESENT<br>EXTRA |
|--|---|-------|---|------------------|
| Total  | *   | Minus | **  | =                |
| Independent                                    | *   | Minus | ***   | =                |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM |   |       |   |                  |

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

| RATE                | ADDI-<br>TIONAL<br>FEE |    | RATE                | ADDI-<br>TIONAL<br>FEE |
|---------------------|------------------------|----|---------------------|------------------------|
| x\$11=              |                        | OR | x\$22=              |                        |
| x41=                |                        | OR | x82=                |                        |
| +135=               |                        | OR | +270=               |                        |
| TOTAL<br>ADDIT. FEE |                        | OR | TOTAL<br>ADDIT. FEE |                        |

(Column 1)

(Column 2)

(Column 3)

| AMENDMENT C                                    | CLAIMS<br>REMAINING<br>AFTER<br>AMENDMENT |       | HIGHEST<br>NUMBER<br>PREVIOUSLY<br>PAID FOR | PRESENT<br>EXTRA |
|--|---|-------|---|------------------|
| Total  | *   | Minus | **  | =                |
| Independent                                    | *   | Minus | ***   | =                |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM |   |       |   |                  |

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

| RATE                | ADDI-<br>TIONAL<br>FEE |    | RATE                | ADDI-<br>TIONAL<br>FEE |
|---------------------|------------------------|----|---------------------|------------------------|
| x\$11=              |                        | OR | x\$22=              |                        |
| x41=                |                        | OR | x82=                |                        |
| +135=               |                        | OR | +270=               |                        |
| TOTAL<br>ADDIT. FEE |                        | OR | TOTAL<br>ADDIT. FEE |                        |

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.  
 \*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."  
 \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."  
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

IMPROVED STABILITY OF LIPID COATED VITAMIN A IN ANIMAL  
FEED ADDITIVES

R.B.Albright (1) AND C.H.Kowarski (2) \*

(1)Lambert-Kay div. of Carter-Wallace , Cranbury N.J.

(2)Temple University School of Pharmacy, Phila. Pa.

ABSTRACT

Lipids have been studied as methods of encapsulation, permeation enhancers, and as drug delivery systems. A lipid coating containing lecithin, cholesterol and functionalized stearyl was utilized in this study to inhibit the mineral catalyzed Vitamin A degradation in a dry flowable animal feed additive. Results indicate much improved stability.

INTRODUCTION

Vitamin A is very susceptible to oxidation, heat, light, moisture and metal catalysis. (1) (2). Oxidation and hydrolysis are accelerated at high temperatures. Solid formulations are as unstable as liquid Vitamin A products due to the large surface area present for reaction (3). In feed mixtures, the presence of water, peroxides, minerals and peroxidized unsaturated fats all add to the instability of Vitamin A.

Mineral mixtures ordinarily are used to supply calcium, phosphorus and trace minerals to animals and can catalyze the oxidative degradation of Vitamin A.

Vitamin A undergoes both pseudo-zero and first order reactions in liquid media (2). Carstensen has found a log-linear ratio between the first order rate constant and water-vapor pressure (5). Controlling the humidity is one method of improving Vitamin A stability in the solid matrix. Vitamin A solid preparations have shown increased stability when Vitamin A was encapsulated in gelatin (2).

The purpose of this study is to investigate the use of lipid coatings on a powder containing absorbed Vitamin A. The formulation is specifically a vitamin/mineral feed supplement for use in animal nutrition.

By coating a vitamin A dispersion in the components of a lipid bilayer, two results may be realized:

1. Stability from mineral catalyzed degradation.  
The lipid bilayer may halt the catalytic decomposition reaction by physically separating Vitamin A from the mineral components.

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\* To whom inquiries should be addressed

2. Stability from hydrolytic degradation. If water permeates the bilayer it may be encapsulated by so-called liposome formation and not be available to interact with vitamin A.

#### MATERIALS AND METHODS

The following materials were used in this study: Vitamin A Palmitate 1,000,000 I.U./ gram was a gift of Hoffman-LaRoche. Lecithin (dry) was food grade and purchased from Central Soya (Decatur, Ill.). Stearylamine was purchased from Aldrich Chemical and Cholesterol U.S.P., Stearic Acid N.F. and Stearyl Alcohol N.F. were purchased from Ruger Chemical. The Lambert-Kay division of Carter-Wallace gave the vitamin/mineral premix used in this study.

The vitamin/mineral premix used in the study is a nutritionally complete mixture of vitamins, amino acids and the following minerals: calcium, phosphorus, potassium, sodium, magnesium, iron, copper, zinc, manganese, and cobalt, as pharmaceutically acceptable salts.

Formulations were prepared in a 5 Kg. Hobart blender at ambient temperature. The Vitamin A Palmitate was adsorbed onto a dry carrier such as Potassium Phosphate Monobasic (Anhydrous). The lipid composition was then melted in a separate vessel (neat) and poured onto the agitating Vitamin A coated carrier. After agitation and cooling (30 minutes), the vitamin/mineral premix was added. Agitation continued for 15 minutes. Total mixing time was 45 minutes. The lab prep was done at ambient temperature and relative humidity. No requirements for an inert atmosphere were utilized.

#### ANALYTICAL METHOD

Vitamin A stability of the powder was analyzed by HPLC using a 0.4 X 30 cm. Porasil column at 313 nm. using a mobile phase of 98:2 Isocotane : Ethyl Ether. Stock and working solutions of Vitamin A palmitate were prepared in hexane and a calibration curve was prepared. Sample preparation consisted of weighing 50-60 mg of sample into 5 ml DMSO. Extraction of the Vitamin A was done with heat and agitation. 25 ml of hexane was added and agitation and centrifugation followed. 5 ml of the supernatant was pipetted into a 50 ml volumetric flask and was diluted with hexane. The injection volume was 7 microliters.

#### STABILITY TESTING

Formulations 1 through 4 were analyzed in accordance with the preceding HPLC method. Storage stability samples of the formulations were analyzed initially, at 1 month, 3 months and 6 months. The samples were stored in the following conditions: ambient temperature (approx. 25 degrees), and 37 degrees centigrade in dark cabinets or ovens. Analyses were run in duplicate and averaged for data analysis.

The finished formulas were split into 300 gram amber tinted polystyrene wide mouth bottles, filled to the top and sealed with a torque of 10 to 20 foot-pounds and stored at the indicated conditions. Initial analysis was done to verify initial concentration and recovery. Each bottle was considered a sample volume and duplicate weighings were done for analysis.

Samples were analyzed by HPLC as previously indicated. The results were averaged and normalized to percent of initial assay (100%) (Table 2). All samples were analyzed for moisture content by Karl Fischer method. In all samples, moisture content was below 1 %.

#### DISCUSSION OF RESULTS

Table 3 is a comparison of zero order and (pseudo) first order constants and their R-squared values. These results were developed from the stability data of Table 2. Once the



TABLE 1  
Formulations of Lipid Coated Powders

| FORMULATIONS NUMBER: | 1.    | 2.    | 3.    | 4.    |
|----------------------|-------|-------|-------|-------|
| LECITHIN             | -     | 1.89  | 1.89  | 1.89  |
| CHOLESTEROL          | -     | 0.83  | 0.83  | 0.83  |
| STEARIC ACID         | -     | -     | 0.28  | -     |
| STEARYLAMINE         | -     | 0.28  | -     | -     |
| STEARYL ALCOHOL      | -     | -     | -     | 0.28  |
| VITAMIN A PALMITATE  | 0.61  | 0.61  | 0.61  | 0.61  |
| POTASSIUM PHOSPHATE  |       |       |       |       |
| MONOBASIC (ANH.)     | 57.88 | 54.98 | 54.98 | 54.98 |
| VIT./MINERAL PREMIX  | 41.71 | 41.81 | 41.81 | 41.81 |

TABLE 2  
Storage Stability Results  
% OF Initial Vitamin A Concentration

| FORMULA :         | 1 (CONTROL) |      | 2    |      | 3    |      | 4     |      |
|-------------------|-------------|------|------|------|------|------|-------|------|
| TEMPERATURE: R.T. | 37          |      | R.T. | 37   | RT   | 37   | R.T.  | 37   |
| 1 MONTH           | 85.2        | 69.0 | 92.2 | 75.0 | 102  | 92.1 | 101.1 | 90.9 |
| 3 MONTHS          | 93.6        | 83.0 | 98.1 | 34.7 | 93.9 | 74.8 | 100.3 | 77.9 |
| 6 MONTHS          | 43.3        | 42.0 | 76.0 | 26.0 | 90.2 | 56.1 | 97.0  | 60.1 |

R.T. is room temperature  
37 is 37 degrees centigrade

TABLE 3  
Comparison Of Slopes and Regression Coefficients  
Of Zero Order and Pseudo-First Order Degradation Profiles

| FORMULATION | TEMP | ZERO ORDER |      | PSEUDO-FIRST ORDER |      |
|-------------|------|------------|------|--------------------|------|
|             |      | SLOPE      | R    | SLOPE              | R    |
| 1 (CONTROL) | R.T. | -5.23      | 0.7  | -10.81             | 0.61 |
|             | 37   | -11.13     | 0.69 | -11.27             | 0.97 |
| 2           | R.T. | -4.16      | 0.93 | -7.51              | 0.58 |
|             | 37   | -22.12     | 0.99 | -17.92             | 0.89 |
| 3           | R.T. | -1.95      | 0.88 | -2.31              | 0.58 |
|             | 37   | -7.38      | 0.99 | -9.81              | 0.82 |
| 4           | R.T. | -0.58      | 0.72 | -0.50              | 0.25 |
|             | 37   | -6.60      | 0.99 | -0.86              | 0.84 |

TABLE 4  
Summary Of Lipid Formulas Reaction Kinetics

| PRODUCT     | TEMP       | REACTION ORDER | %LOSS/DAY | VITAMIN A LOSS/DAY |
|-------------|------------|----------------|-----------|--------------------|
| 1 (CONTROL) | R.T.       | 1              | 0.172     | 258                |
|             | 37 DEGREES | 1              | 0.388     | 549                |
| 2           | R.T.       | 0              | 0.137     | 205.5              |
|             | 37 DEGREES | 0              | 0.727     | 1090.5             |
| 3           | R.T.       | 0              | 0.084     | 98.0               |
|             | 37 DEGREES | 0              | 0.243     | 394.5              |
| 4           | R.T.       | 0              | 0.019     | 28.5               |
|             | 37 DEGREES | 0              | 0.217     | 325.5              |

Vitamin A loss per day is based on a normalized initial dose of 150,000 I.U.

lipid coating is applied to the Vitamin A powder, it is interesting to note that the reaction order seems to shift from (pseudo) first order to zero order. This shift is most obvious in the 37 degree data. This may indicate that the decomposition pathway may have changed. This will be the subject of future investigation.

The evaluated temperature data in all cases indicates a substantial increase in degradation of 37 degrees over room temperature for each system. This is due to the low melting range of the lipid coating. In all cases the lipid coating begins its phase transition at 35 degrees. This must be taken into consideration for purposes of commercial utility.

The addition of the lipid coatings to a dispersion of Vitamin A powders definitely increases stability at room temperature (TABLE 4). The decomposition of Vitamin A is retarded in each experimental system as follows:

| EXPERIMENT | SYSTEM                                   | FACTOR OF STABILITY IMPROVEMENT |
|------------|--|---------------------------------|
| 1          | CONTROL                                  | 1                               |
| 2          | LECITHIN/CHOLESTEROL/<br>STEARYLAMINE    | 2.63                            |
| 3          | LECITHIN/CHOLESTEROL/<br>STEARIC ACID    | 5.55                            |
| 4          | LECITHIN/CHOLESTEROL/<br>STEARYL ALCOHOL | 20.0                            |

This data indicates that a lipid coating deposited on the substrate containing absorbed Vitamin A retards degradation of the vitamin while in the presence of minerals which would otherwise catalyze degradation.

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1. Harris, Robert , The Vitamins , 2nd Edition Volume 1 Academic Press NY 1967 p.245
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3. Buhler V. Vandemecum for Vitamin Formulations , Wissen Schaffliche, Verlagsgesell  
schaft mb H Stuttgart (1988)
4. Halverson A.W. and Hendrick C.M., Poultry Sci. 34:355 (1955)
5. Carstensen, J.T. J.Pharm. Sci. 53:839 (1964)



US005919451A

# United States Patent [19]

Cook et al.

[11] **Patent Number:** **5,919,451**  
 [45] **Date of Patent:** **Jul. 6, 1999**

[54] **METHOD OF IMPROVING THE GROWTH  
OR THE EFFICIENCY OF FEED  
CONVERSION OF AN ANIMAL AND  
COMPOSITIONS FOR USE THEREIN**

|           |         |               |          |
|-----------|---------|---------------|----------|
| 4,550,019 | 10/1985 | Polson        | 424/85   |
| 4,748,018 | 5/1988  | Stolle et al. | 424/87   |
| 5,080,895 | 1/1992  | Tokoro        | 424/85.8 |
| 5,428,072 | 6/1995  | Cook et al.   | 514/460  |
| 5,725,873 | 3/1998  | Cook et al.   | 424/442  |

[75] **Inventors:** **Mark E. Cook, Madison, Wis.; Darla  
L. Jerome, Frazee, Minn.**

[73] **Assignee:** **Wisconsin Alumni Research  
Foundation, Madison, Wis.**

[21] **Appl. No.:** **09/037,690**

[22] **Filed:** **Mar. 10, 1998**

## Related U.S. Application Data

[63] Continuation-in-part of application No. 08/684,785, Jul. 22, 1996, Pat. No. 5,725,873.

[51] **Int. Cl.<sup>6</sup>** ..... **A61K 39/395; A23J 3/12;  
A23J 1/06; A23K 1/16**

[52] **U.S. Cl.** ..... **424/130.1; 424/157.1;  
424/158.1; 424/442; 106/124.1; 426/89;  
426/140; 426/657; 530/388.2**

[58] **Field of Search** ..... **424/442, 283.1,  
424/130.1, 157.1, 158.1; 106/147.3, 148.1,  
243; 426/89, 92, 140, 657; 530/388.24,  
388.85, 389.2**

[56] **References Cited**

## U.S. PATENT DOCUMENTS

|           |         |                  |         |
|-----------|---------|------------------|---------|
| 3,119,691 | 1/1964  | Ludington et al. | 99/2    |
| 4,357,272 | 11/1982 | Polson           | 260/112 |

## FOREIGN PATENT DOCUMENTS

|           |         |                    |
|-----------|---------|--------------------|
| 0231817A2 | 8/1987  | European Pat. Off. |
| 0241441A1 | 10/1987 | European Pat. Off. |
| 0426463A2 | 5/1991  | European Pat. Off. |
| WO9101803 | 2/1991  | WIPO               |
| 0556883A1 | 8/1993  | WIPO               |
| WO9421284 | 9/1994  | WIPO               |
| WO9604933 | 2/1996  | WIPO               |
| 0707798A1 | 4/1996  | WIPO               |
| WO9622028 | 7/1996  | WIPO               |

## OTHER PUBLICATIONS

Albright, RB et al. *Drug. Dev. Ind. Pharm.* 20(12):2035-2039, Jul. 1994.

*Primary Examiner*—David Saunders

*Assistant Examiner*—F. Pierre VanderVegt

*Attorney, Agent, or Firm*—Quarles & Brady LLP

[57] **ABSTRACT**

A method of improving the efficiency of an animal to convert feed into desirable body tissue involves feeding the animal feed particles having an inner core of nutrients and an outer layer containing a conjugated fatty acid or an antibody that can protect the animal from contacting diseases that can adversely affect the animal's ability to grow or efficiently convert its feed into body tissue.

**7 Claims, No Drawings**

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# METHOD OF IMPROVING THE GROWTH OR THE EFFICIENCY OF FEED CONVERSION OF AN ANIMAL AND COMPOSITIONS FOR USE THEREIN

## CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part application of application No. 08/684,785, filed Jul. 22, 1996, now U.S. Pat. No. 5,725,873, issued Mar. 10, 1998.

## STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable.

## BACKGROUND OF THE INVENTION

The present invention relates generally to the feeding of animals. More particularly, it relates to a method of improving the animal's growth or the efficiency of the animal to convert its feed into desirable body tissue (e.g. muscle) and compositions for use in the method.

It is known that healthy, disease-free animals grow faster or are more able to convert their feed efficiently into body tissue than sick or immune-challenged animals. Obviously, faster growth or a more efficient conversion of feed into desirable body tissue in an animal is both economically and ecologically important, especially in animals raised for food. For this, and other reasons, it is desirable to prevent animals from contacting diseases.

One approach to keeping animals healthy is to give the animals antibiotics. However, that approach is not desirable for animals raised for food because there can be antibiotic residues in the food.

Another approach to keeping animals healthy is to immunize the animals. This can be done by vaccinating the animals against specific diseases to produce an active immunization or by administering to the animals antibodies to produce a passive immunization.

In U.S. Pat. Nos. 4,748,018 and 5,080,895, methods are disclosed for passively immunizing animals against intestinal diseases which could interfere with the animal's efficient conversion of feed. The patented methods basically comprise orally administering to said animals effective amounts of egg-derived materials containing avian antibodies which are obtained by immunizing egg-laying hens with specific antigens which will produce such antibodies, and obtaining the antibody containing material from eggs laid by the hen. In both patents, the antibody containing egg materials are reduced to powders and fed to the animals to be passively immunized.

## BRIEF SUMMARY OF THE INVENTION

It is the primary object of the present invention to disclose a novel method to improve the animals growth or the efficiency of the animal to convert its feed into desirable body tissue.

Another object of the invention is to disclose an animal feed for animals for use in the inventive method.

The method of the present invention to improve the animals growth or the efficiency of the animal to convert its feed into desirable body tissue comprises orally administering to said animal feed particles having an inner core comprising primarily non-fat nutrients and, on an outer surface of the inner core, a safe and effective amount of an

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antibody that help protect the animal from disease or other antigens that can adversely affect the animal's growth or the efficiency of the animal to convert feed into desirable body tissue. The particles can alternatively be coated with another compound that improves the efficiency of the animal to convert feed into desirable body tissue.

The compositions of the present invention are animal feed particles having an inner core comprised of nutrients, and, on an outer surface of the inner core, a compound that improves the efficiency of the animal to convert feed into desirable body tissue.

The compositions of the present invention are conveniently made by first forming a nutrient mixture to produce an inner core, and then depositing the compound on the outer surface of the core. Surprisingly, an antibody on the outer surface retains immunological activity and is not destroyed by antibody destroying factors, such as environmental conditions and intestinal proteases, even if the antibody is simply applied to the exterior of the pellet core without encapsulation in a protective fat layer.

In a preferred embodiment of the invention, antibodies are provided in solution or suspension in an aqueous or lipid carrier, although the antibodies can be applied directly to the pellet core without a carrier as, for example, a powder. The antibodies can be, but need not be, encapsulated in the lipid. The antibodies are obtained from the egg of a hen which has been injected with an antigen that results in the production by the hen of those antibodies.

Compositions of the present invention are superior to previously known animal feeds in which antibody-containing powders were mixed with nutrients, including fat, and then granulated or extruded, because the antibody-containing layer in the method of the present invention is applied to the core after the pelletization, extrusion, granulation or expansion process. As a result the antibodies in the outer layer of the compositions of the present invention are not degraded by elevated temperatures that can arise during pelletization, granulation, extrusion or expansion processes. The compositions of the present invention are also superior to prior art feeds. If the antibodies are mixed into an outer layer of fat, the fat helps protect the antibodies from stomach acid and intestinal enzymes. If the antibodies are not encapsulated in fat, they can be immediately released at high concentration into the gastrointestinal tract of the consuming animal and are not degraded upon ingestion.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Not applicable.

## DETAILED DESCRIPTION OF THE INVENTION

In the preferred embodiment of the present invention, the animal feed particles comprise an extruded inner core which contains primarily the desired non-fat materials, such as proteins and carbohydrates, and an outer layer of a compound that improves the efficiency of the animal to convert feed into desirable body tissue. The compound is preferably an antibody which can be optionally encapsulated in a lipid layer. Another compound that can be provided on the outer surface is a fatty acid that improves feed conversion efficiency. A preferred fatty acid is an 18-carbon conjugated diene. A most preferred fatty acid is conjugated linoleic acid (CLA). The outer layer also can contain other ingredients, such as oil-soluble vitamins and the inner core can, of course, also contain fat, if desired.

In the preferred practice of the method of invention, the animal feed is orally fed to the animal in an amount which will passively immunize the animal or otherwise enhance the efficiency of feed conversion by the animal.

The antibodies for use in the present invention are those which can alter physiological processes that adversely affect growth and feed efficiency. They can be antibodies that are against diseases or specific endogenous regulators of food intake and gastrointestinal motility. The antibodies are preferably derived from the eggs of hens which have been previously immunized to produce those antibodies as described in U.S. Pat. Nos. 4,748,018 or 5,080,895. Especially preferred as the antibody-containing material are spray dried egg yolks and whole eggs. However, other non-egg derived antibody-containing materials may be used.

The free CLA isomers have been previously isolated from fried meats and described as anticarcinogens by Y. L. Ha et al., in *Carcinogenesis* 8(12):1881-1887 (1987). Since then, they have been found in some processed cheese products. Y. L. Ha, et al., *J. Agric Food Chem.* 37(1):75-81 (1987).

The free acid forms of the CLA may be prepared by isomerizing linoleic acid. The non-toxic salts of the free CLA may be made by reacting the free acids with a non-toxic base. Natural CLA may also be prepared from linoleic acid by the action of delta 12-cis, delta 11-trans isomerase from a harmless microorganism such as the rumen bacterium *butyrivibrio fibrisolvens*. Harmless microorganisms in the intestinal tracts of rats and other monogastric animals may also convert linoleic acid to CLA (Chin, S. F. et al., *FASEB J.* v. 6, abstract #2665 (1992)).

The CLA obtained by the practice of the described methods contains one or more of the 9,11-octadecadienoic acids and/or the 10,12-octadecadienoic acids and active isomers thereof. It may be free or bound chemically through ester linkages. The CLA is heat stable and can be used as is, or dried and powdered. The CLA is readily converted into a non-toxic salt, such as the sodium or potassium salt, by reacting chemically equivalent amounts of the free acid with an alkali hydroxide at a pH of about 8 to 9.

CLA can be a mixture of isomers of 9,11- and 10,12-octadecadienoic acid (c9, c11; c9, t11; t9, c11; t9, t11; c10, c12; t10, c12; c10, t12; and t10, t12) that would form from isomerization of c9, c12-octadecadienoic acid. As a result of the isomerization, only four isomers (c9, c11; c9, t11; t10, c12; and c10, c12) would be expected. However, of the four isomers, c9, t11- and t10, c12 isomers are predominantly produced during the autoxidation or alkali-isomerization of c9, c12-linoleic acid due to the co-planar characteristics of carbon atoms around a conjugated double-bond and spatial conflict of the resonance radical. The remaining two c,c-isomers are minor contributors.

The relatively higher distribution of the t,t-isomers of 9,11- or 10,12-octadecadienoic acid apparently results from the further stabilization of c9, t11- or t10, c12-geometric isomers, which is thermodynamically preferred, during an extended processing time or long aging period. Additionally, the t,t isomer of 9,11- or 10,12-octadecadienoic acid that was predominantly formed during the isomerization of linoleic acid geometrical isomers (t9, t12-, c9, t12- and t9, c12-octadecadienoic acid) may influence the final ratio of the isomers or the final CLA content in the samples.

Linoleic acid geometrical isomers also influence the distribution of minor contributors (c,c-isomers of 9,11- and 10,12-, t9, c11- and c11, t12-octadecadienoic acids). The 11,13-isomer might be produced as a minor product from c9, c12-octadecadienoic acid or from its isomeric forms during processing.

The preferred inner core for the animal feed particles is an extrusion which contains a mixture of nutrients, such as grains, with or without added sugars, carbohydrates and/or proteins. The core will normally contain less than the desired total amount of the dietary fat for the animal because of the fat in the outer layer.

The fat for use in the outer layer can be any fat or lipid, which can be readily mixed with the antibody containing material to form a mixture, which contains the antibody therein and which can be readily sprayed or otherwise coated on the outer surface of the core. The antibody need not be directly on the surface of the inner core. Rather, one or more intermediate layers, comprising, for example, a binding agent, can be provided between the antibody and the core. Especially preferred are those fats which are solid at ambient temperatures and which will protect the antibodies from adverse environmental conditions and intestinal enzymes. Especially preferred as the fat is a mixture of tallow and CLA which increases feed efficiency.

Representative of other fats that can be used are the following:

- Lard
- Yellow Grease
- Poultry Fat
- Spent Restaurant Oil
- Animal Oils
- Vegetable Oils
- Fish Oils
- Oil Derivatives, i.e. lecithin and
- Mixtures thereof.

The practice of the present invention is further illustrated by the following examples:

#### EXAMPLE 1

##### Preparation Of Antibodies

An antigen, such as cholecystokinin peptide which produces cholecystokinin (CCK) antibodies, is injected intramuscularly into mature hens at a dose of about 50 µg to 1000 µg with a water-in-oil emulsion adjuvant. Samples of the whole eggs or yolks of eggs from the hens are assayed by known methods for CCK antibody content. When the CCK antibody titer reaches a maximum level, the whole eggs or yolks of eggs are collected and pooled, homogenized and spray dried to obtain a powder.

#### EXAMPLE 2

##### Preparation Of Animal Feed Particles With Outer Layer Of Fat Containing Antibodies

A CCK antibody-containing powder made by the process of Example 1 is mixed with tallow to form a blend in which the powder is substantially encapsulated by the fat. The fat mixture is then spray coated upon inner cores made by the pelletization, the granulation, the extrusion or the expansion of a plasticized mixture of nutrients, including carbohydrate, protein and water. The resulting animal feed particles have an inner core of nutrients and an outer layer of fat containing CCK antibodies.

#### EXAMPLE 3

##### Animal Feeding Test

Ducks are fed the animal feed of Example 2 and their biological responses are determined. It is found that the

ducks receiving the animal feed of Example 2 demonstrate an improved body weight gain and a more efficient rate of feed conversion than control ducks.

Table 1 shows the results obtained in 14 day old ducks fed a control feed and an otherwise identical feed (BRAVO) having an outer antibody-containing layer.

TABLE 1

| ABOVE BODY WEIGHT SUMMARY |                 |                |                 |
|---------------------------|-----------------|----------------|-----------------|
| TREATMENT                 | 14 day weight   | 27 day weight  | 14-27 day gain  |
| Control                   | 0.66 kg         | 2.03 kg        | 1.37 kg         |
| Bravo                     | 0.63 kg         | 1.96 kg        | 1.33 kg         |
| TREATMENT                 | 39 day weight   | 14-39 day gain |                 |
| Control                   | 3.15 kg         | 2.49 kg        |                 |
| Bravo                     | 3.23 kg         | 2.60 kg        |                 |
| FEED CONVERSION DATA      |                 |                |                 |
| TREATMENT                 | 14-27 feed/bird | 0-27 feed/bw*  | 14-17 feed/gain |
| Control                   | 2.50 kg         | 0.558 kg       | 1.826 kg        |
| Bravo                     | 2.34 kg         | 0.541 kg       | 1.76 kg         |
| TREATMENT                 | 14-39 feed/bird | 0-39 feed/bw*  | 14-39 feed/gain |
| Control                   | 5.349 kg        | 0.781 kg       | 2.15 kg         |
| Bravo                     | 4.930 kg        | 0.695 kg       | 1.90 kg         |

\*bw = body weight

## EXAMPLE 4

A CCK antibody-containing powder made by the process of Example 1 were mixed with tallow to form a blend in which the powder was substantially encapsulated by the fat. The fat mixture was then spray coated upon the inner cores, as described in Example 2, at the indicated antibody levels.

Chickens were fed the animal feed and their biological responses were determined. Table 2 shows the results obtained in chickens fed the coated feed pellets (crumbles) for three weeks. Also shown are the results obtained when chickens were fed a standard feed mash containing the indicated amounts of the anti-CCK antibody.

In the course of the trial, both the rate of body gain and the feed efficiency were markedly higher in chickens fed the antibody-coated pellets than in those fed antibody-containing mash. Surprisingly, a superior increase is observed (relative to control feed) when the antibody is provided on pellets than as a component of mash.

TABLE 2

| Treatment     | Week 1 Body Wt | Week 0-1 Body Wt Gain | Feed/Bird 0-1 Consumed | Feed/Body Wt | Feed/Body Wt Gain |
|---------------|----------------|-----------------------|------------------------|--------------|-------------------|
| Week 1 (Mash) |                |                       |                        |              |                   |
| Control       | 132            | 93                    | 124                    | 0.938        | 1.344             |
| 0.075* Bravo  | 136            | 97                    | 132                    | 0.969        | 1.368             |
| 0.25 Bravo    | 138            | 98                    | 131                    | 0.947        | 1.338             |
| 0.75 Bravo    | 127            | 87                    | 125                    | 0.984        | 1.442             |

TABLE 2-continued

| Treatment         | Week 1 Body Wt | Week 0-1 Body Wt Gain | Feed/Bird 0-1 Consumed | Feed/Body Wt | Feed/Body Wt Gain |
|-------------------|----------------|-----------------------|------------------------|--------------|-------------------|
| Week 2 (Crumbles) |                |                       |                        |              |                   |
| Control           | 152            | 112                   | 143                    | 0.942        | 1.287             |
| 0.075 Bravo       | 149            | 108                   | 156                    | 1.049        | 1.450             |
| 0.25 Bravo        | 155            | 114                   | 141                    | 0.969        | 1.315             |
| 0.75 Bravo        | 147            | 107                   | 137                    | 0.928        | 1.273             |
| Week 2 (Mash)     |                |                       |                        |              |                   |
| Control           | 311            | 272                   | 384                    | 1.237        | 1.421             |
| 0.075 Bravo       | 329            | 290                   | 400                    | 1.218        | 1.386             |
| 0.25 Bravo        | 323            | 283                   | 396                    | 1.226        | 1.401             |
| 0.75 Bravo        | 291            | 251                   | 353                    | 1.244        | 1.451             |
| Week 2 (Crumbles) |                |                       |                        |              |                   |
| Control           | 366            | 325                   | 477                    | 1.243        | 1.390             |
| 0.075 Bravo       | 358            | 317                   | 457                    | 1.278        | 1.444             |
| 0.25 Bravo        | 358            | 317                   | 470                    | 1.314        | 1.485             |
| 0.75 Bravo        | 352            | 313                   | 413                    | 1.174        | 1.324             |
| Week 3 (Mash)     |                |                       |                        |              |                   |
| Control           | 624            | 584                   | 823                    | 1.316        | 1.406             |
| 0.075 Bravo       | 635            | 595                   | 845                    | 1.334        | 1.423             |
| 0.25 Bravo        | 608            | 568                   | 835                    | 1.375        | 1.473             |
| 0.75 Bravo        | 569            | 529                   | 787                    | 1.382        | 1.488             |
| Week 3 (Crumbles) |                |                       |                        |              |                   |
| Control           | 683            | 642                   | 936                    | 1.373        | 1.461             |
| 0.075 Bravo       | 697            | 656                   | 956                    | 1.372        | 1.457             |
| 0.25 Bravo        | 699            | 659                   | 971                    | 1.395        | 1.482             |
| 0.75 Bravo        | 687            | 648                   | 893                    | 1.299        | 1.379             |

\*grams of anti-CCK egg yolk per kilogram of feed.

## EXAMPLE 5

Ducks were fed a pelleted diet on which either 0.5% corn oil (control) or 0.5% conjugated linoleic acid was sprayed on the outer surface of the pellets. The coated pellets were fed to 14 day old ducks for 13 days. Feed conversion (feed consumed per amount of gain) was determined from 14 to 27 days and 29 to 39 days of age.

TABLE 3

| Treatment | 14-27 day conversion | 29-39 day conversion |
|-----------|----------------------|----------------------|
| Control   | 1.82                 | 2.38                 |
| CLA       | 1.79                 | 2.14                 |

Feeding CLA from 14 to 27 days of age reduced feed conversion (pounds of feed per pound of gain). The effects of feeding pellets coated with CLA continued to have an effect even for the period between 29 to 39 days of age.

It will be apparent to those skilled in the art that the present invention can be used to prepare the animal feed for a wide variety of food animals or pets, including without limitation, ducks, chickens and turkeys.

It also will be readily apparent to those skilled in the art that a large number of changes and modifications can be made without departing from the spirit and scope of the present invention. Therefore, it is intended that the invention only be limited by the claims which follow.

We claim:

1. A method to improve the growth of an animal or the efficiency of an animal to convert feed into desired body tissue, said method comprising feeding an animal an effective amount of animal feed particles comprising an inner core of nutrients and having an outer surface, and a layer

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consisting essentially of unencapsulated antibodies on the outer surface of the inner core,

said antibodies being antibodies that can passively immunize the animal against the adverse effects of an endogenous gut peptide which could reduce the animal's ability to grow or to efficiently convert its feed into desirable body tissue, wherein the method achieves superior growth or feed conversion than a second method wherein a comparable amount of the antibody is fed to the animal in an unpelleted form.

2. A method of claim 1 in which the antibodies are derived from a chicken egg.

3. A method of claim 1 in which the antibody is anti-cholecystokinin antibody.

4. A method to improve the growth of an animal or the efficiency of an animal to convert feed into desired body tissue, said method comprising feeding an animal an effective amount of animal feed particles comprising an inner core of nutrients and having an outer surface, and a layer consisting essentially of unencapsulated antibodies and conjugated linoleic acid on the outer surface of the inner core,

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said antibodies being antibodies that can passively immunize the animal against the adverse effects of an endogenous gut peptide which could reduce the animal's ability to grow or to efficiently convert its feed into desirable body tissue, wherein the method achieves superior growth or feed conversion than a second method wherein the antibody is fed to the animal in an unpelleted form.

5. A particulate animal feed comprising an inner core of nutrients, the core having an outer surface, and a layer consisting essentially of at least one unencapsulated antibody to an endogenous gut peptide on the outer surface of the inner core.

6. A particulate animal feed as claimed in claim 5 wherein the antibodies are anti-cholecystokinin antibodies.

7. A particulate animal feed comprising an inner core of nutrients, the core having an outer surface, and a layer consisting essentially of conjugated linoleic acid and at least one unencapsulated antibody to an endogenous gut peptide on the outer surface of the inner core.

\* \* \* \* \*



UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 5,919,451  
DATED : July 6, 1999  
INVENTOR(S) : Mark E. Cook and Daria L. Jerome

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1,

Line 9, please delete the entire paragraph and insert therefor the following:


-- This invention was made with United States government support awarded by the following agencies:

USDA 96-CRHR-0-6055

The United States has certain rights in this invention. --

Signed and Sealed this

Ninth Day of December, 2003

A handwritten signature in black ink, appearing to read "James E. Rogan", with a horizontal line drawn underneath it.

JAMES E. ROGAN  
*Director of the United States Patent and Trademark Office*